SEVENTY FIVE CENTS MAY / JUNE 1973 02377

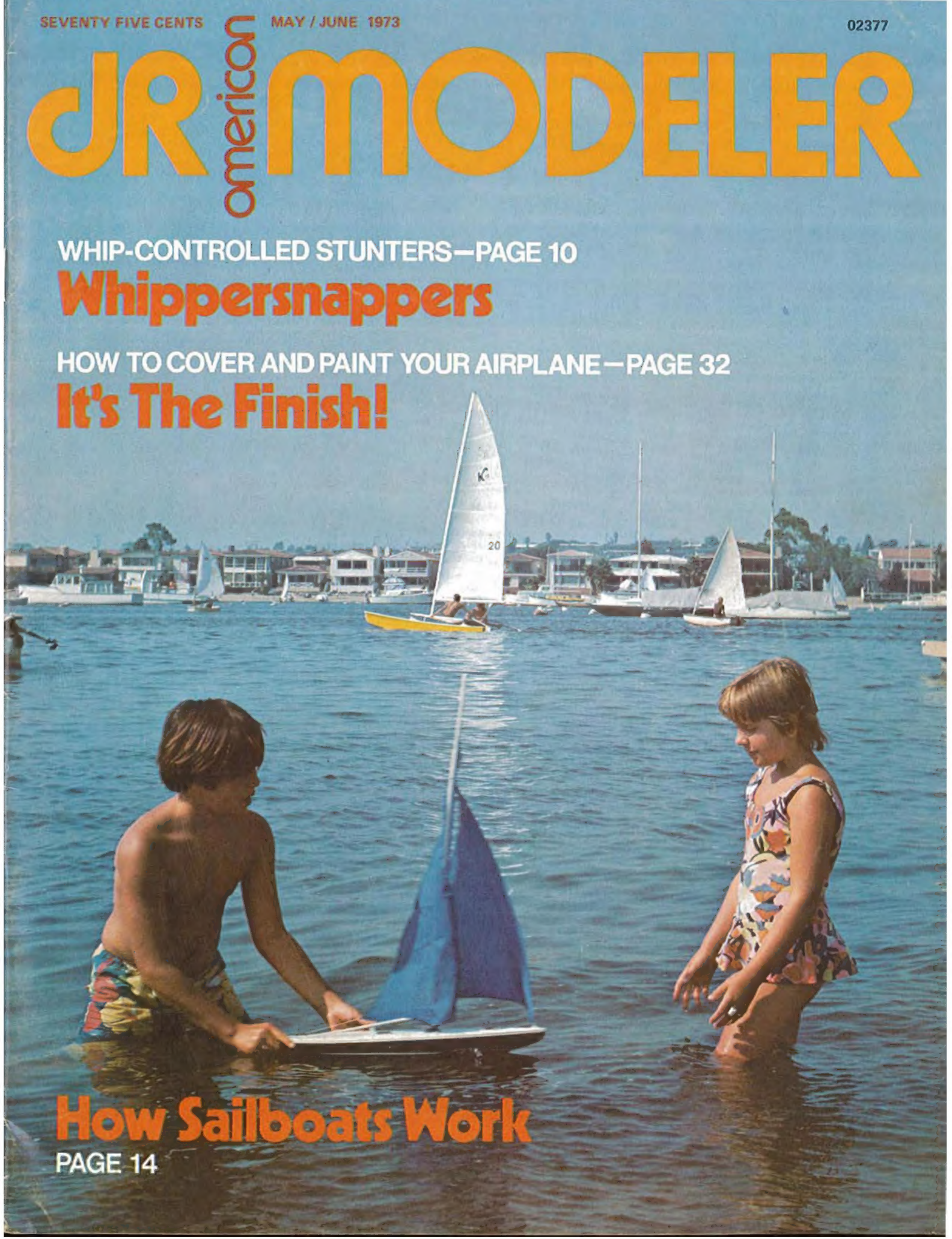
American JR MODELER

WHIP-CONTROLLED STUNTERS—PAGE 10

Whippersnappers

HOW TO COVER AND PAINT YOUR AIRPLANE—PAGE 32

It's The Finish!



How Sailboats Work

PAGE 14

RICK FOCH, AGE 15, ISN'T AN EXPERT YET... BUT ALREADY HE'S WINNING EVENTS USING TOP FLITE MODELS AND PRODUCTS

DEAR SIRS:

TWO YEARS AGO ON CHRISTMAS I RECEIVED YOUR P-47 THUNDERBOLT KIT. I AM NOW 15 AND ALTHOUGH I HAVE BEEN BUILDING AND FLYING MODEL AIRPLANES FOR 10 YEARS, UNTIL LAST AUGUST, I HAD NEVER ENTERED A CONTEST. AFTER BEING A SPECTATOR AT A LOCAL CONTEST, I WAS INSPIRED TO GO ALL OUT ON MY P-47 FOR THE FLYING SCALE EVENT.

I BEGAN CONSTRUCTING THE KIT IN AUGUST 1971 AND THROUGH ENJOYABLE BUT TIME CONSUMING WORK, THE MODEL BEGAN TO TAKE SHAPE.

LAST FEBRUARY I WROTE TO YOU ABOUT A PROBLEM I HAD IN FINDING A 3-VIEW DRAWING. LESS THAN A WEEK LATER I RECEIVED A BEAUTIFUL DRAWING. I WOULD LIKE TO THANK YOU FOR YOUR EXCELLENT SERVICE.

ELEVEN MONTHS LATER, MY THUNDERBOLT WAS FINISHED. I FOLLOWED THE PLANS EXACTLY, USING AERO-GLOSS GLUE AND DOPE, AND POWERING IT WITH A McCOY .19 SWINGING A 9-5 POWER PROP SLIGHTLY CUT DOWN.

ON THE FIRST FLIGHT, THE P-47 DELIVERED EXCELLENT PERFORMANCE. EVIDENTLY THIS IS BECAUSE OF THE UNBELIEVABLY LIGHT WEIGHT OF 23 OUNCES

ON THE SECOND FLIGHT (EVER!), I WON 1 ST. PLACE IN A COMBINED (J,S, & O) SCALE EVENT AT A LOCAL CONTEST. (THIS WAS MY FIRST CONTEST TOO!) THREE WEEKS LATER, ON SEPTEMBER 3rd, I WON THE DISTRICT II SCALE CHAMPIONSHIP AT JACKSONVILLE, FLA., JUNIOR AGE CLASS. THIS WAS ON THE MODEL'S THIRD FLIGHT! (I BEAT A .35 POWERED TOPFLITE MUSTANG BY 1 POINT.)

THIS IS THE FIRST TIME I HAVE EVER THANKED A MANUFACTURER, AND TOPFLITE DESERVES IT. I LOVE MONOKOTE, ENJOY YOUR KITS, AND FIND YOUR PROPS THE CLOSET THING TO PERFECTION.

I WOULD LIKE TO CLOSE BY SAYING THAT THE P-47 FLIES LIKE A GOOD SPORT MODEL AND WOULD RECOMMEND IT TO ANYONE INTERESTED IN FLYING SCALE MODELS.

YOURS VERY TRULY
RICK FOCH

TOP FLITE MODELS 2635 S. WABASH AVE., CHICAGO, ILL. 60616

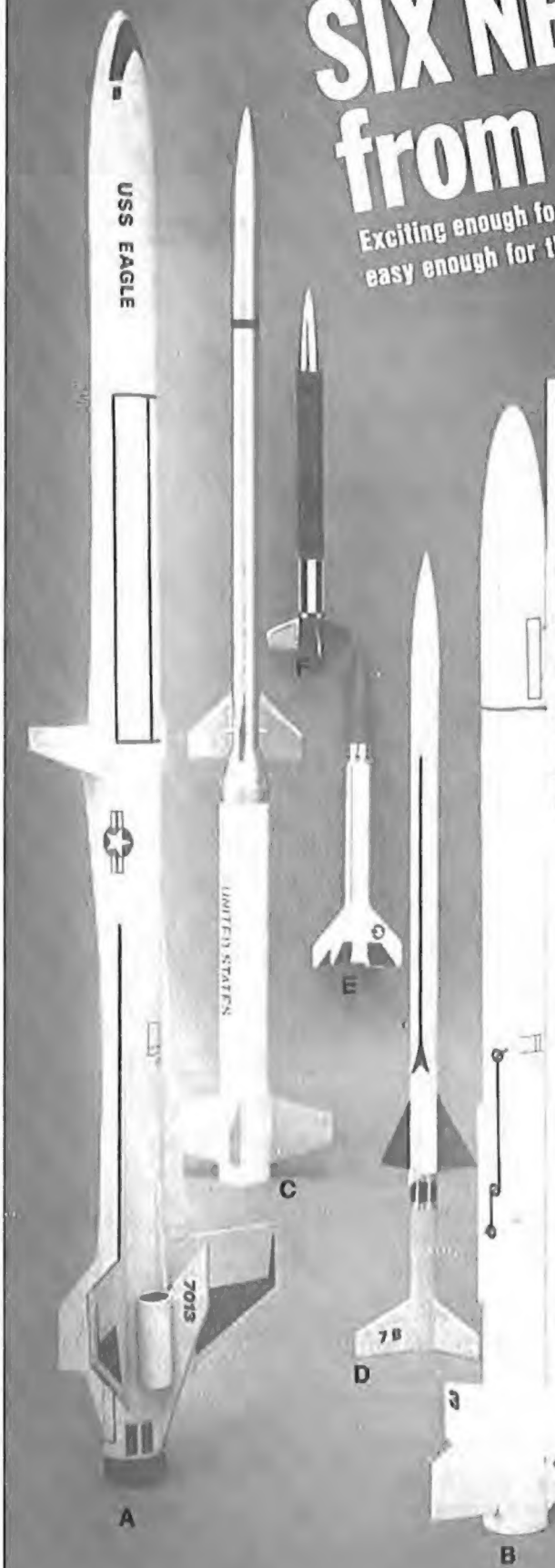
SIX NEW KITS from AVI!

Exciting enough for the expert, easy enough for the beginner.

Here they are! A whole space fleet of just-released model rocket excitement.

KITS: 6 hot, new entries like the quick-flying Mini-Hawk, new "big" rockets and AVI's scrappy International Award Winning P-Chuter.

MOTORS: 16 new motors in all. From the "short delay" Minijets to the all new big payload Delta-Vee E and F series. All available now from AVI at the *lowest prices in the entire industry!*



ORDER NOW!

Make your selections on the handy clip and mail order form below.

NEW KITS Come complete, ready-to-build with full instructions. (Order motors separately below).

	MODEL	TYPE	LENGTH	BODY DIA.	NT. WT.	R'CMMED MOTOR(S)	UNIT PRICE	QUAN.	TOTAL
A	U.S.S. EAGLE	Sport	37"	1.6"	4.2 oz.	Delta-Vee E26-4 or F70-6	$4.95		
B	SOUNDER	Hi-performance Sport	30"	1.6"	2.7 oz.	E26-8 or F70-10	3.95		
C	NIKE-TOMAHAWK	Scale	31"	1.4"	3.5 oz.	Thruster 18 B6-2, C6-2 or D8-3	3.50		
D	SPACE ANGEL	2-Stage Sport	18"	0.6"	0.7 oz.	Minijet A3-0m booster and A3-6m	2.00		
E	MINI-HAWK	Sport	10.5"	0.8"	0.7 oz.	A3-6m	1.00		
F	P-CHUTER	Contest	12"	0.8"	0.5 oz.	A3-6m	2.00		

NEW MOTORS

MINIJETS (13 x 60 mm, 0.150 x 2.75 ins.) Four motors per pack plus igniters and wadding.

NUMBER	UNIT PRICE	QUAN.	TOTAL
1/A3-1m	$1.05		
A3-0m Booster	1.15		
A3-2m	1.15		
B3-0m Booster	1.25		
B3-3m	1.25		
A3-6m	1.15		

THRUSTER 18 (18 x 70 mm, 0.690 x 2.75 ins.) Three motors per pack, plus igniters and wadding.

NUMBER	UNIT PRICE	QUAN.	TOTAL
A3-4	$ 90		
B6-2	1.00		
B6-6	1.00		
C6-2	1 20		
D8-0 Booster	1.50		
D8-3	1.50		
D8-5	1.50		

DELTA-VEE (E — 28 x 75 mm, 1.125 x 3.00 ins. F — 28 x 1.25 mm, 1.125 x 5.00 ins.) One motor per pack, plus igniters and wadding.

NUMBER	UNIT PRICE	QUAN.	TOTAL
E26-4	$2 50		
E26-8	2.50		
F70-6	3.50		
F70-10	3 50		

TOTAL ORDER $_____

NAME_____

ADDRESS_____

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Amount Enclosed $_____

Include payment with order. Orders for $10.00 or more shipped pre-paid. For orders less than $10.00, add 10% of total order amount to cover postage and handling.

FREE Packet of DECALS and CLOTH IRON-ON PATCH included with all orders of $10.00 or more!

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P.O. Box 77
Mineral Point 53565

PLUS SIXTEEN NEW MOTORS!

JR American MODELER

THE HOW-TO-DO-IT MAGAZINE FOR THE BEGINNER AND SPORT FLIER.

VOLUME 2, NUMBER 4 MAY-JUNE 1973

FEATURES:

ARTICLES:

DEPARTMENTS:

Thunderbolts - page 38

Show Off - page 42

Published bi-monthly by Potomac Aviation Publications, Inc., 733 Fifteenth Street, N.W., Washington, D.C. 20005. William J. Winter, Publisher; Edward C. Sweeney, Jr., President; Harvey E. Cantrell, Secretary and Business Manager.

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CARL GOLDBERG

"TODAY I SAW THE IMPOSSIBLE HAPPEN"

Dear Sirs:

When I bought my first Carl Goldberg model, I didn't believe all the propoganda that was written about the "Lil' Wizard". I took it home and built it, put a psychedelic paint job on it and then showed it off to all my friends. I was still afraid to fly it because I had never flown before.

The first time I launched it, it went five laps and then I crashed it. To my surprise it wasn't hurt. Promise number 1-fulfilled. On flight number two, it never came out of the air until it ran out of fuel. I have since then flown over fifteen perfect flights. But today I saw the impossible happen. It flew two perfect flights in winds of up to 20 MPH. The other guy's plane is now being repaired. Thanks to foil-safe my plane is still beautiful. I used a broken pop-sicle stick as a shim for the engine to be tilted to the right.

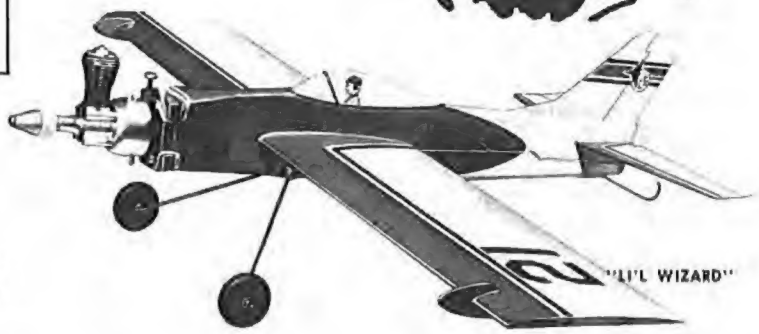
The next flying model I buy will be Carl Goldberg. I didn't like the decals that you sent with the model so I cut patterns in some masking tape and made my own. You should tell kids that they can make good insignia that way.

Keep up the good work.

A happy customer

Steve Jordon

MODELERS—
LET US HEAR YOUR EXPERIENCES!



Every Carl Goldberg Model Has . . .

- *Each Step Clearly Pictured*
- *Proven Flying Performance*

• FREE FLIGHT

BEGIN WITH RUBBER POWER!

RANGER 21 — All die-cut balsa parts. 21" span beauty. $1.98

RANGER 28—"Pre-fab plus paper," 28" span, 2 colors. $1.98

SHOESTRING RACER — 18" span. All die-cut balsa. $1.98

CESSNA 180 — The champion of business liners, 21" span. $1.98

SPIRIT OF ST. LOUIS — A miniature duplicate, 21" wingspan. $1.98

SOAR WITH FREE FLIGHT!

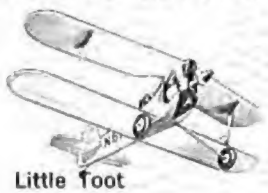
½ A BLAZER — Die-cut balsa, tissue, 40" span, for .049 engine. $4.95

RANGER 30 — Die-cut balsa, 30" span, for .010-.049 engine. $3.95

VIKING — 48" span, Hi-thrust, for .049-.051 engine. $5.95

• CONTROL LINE

MOVE UP TO CONTROL LINE!



LITTLE TOOT — Sporty Biplane, for .049 engine, all die-cut balsa. $3.95

LI'L WIZARD — Shaped balsa wing, die-cut fuselage, 21" span, for .049 engine. $3.95

STUNT MAN 23 — Die-cut balsa, 23½", for .049-.09 engine. $3.95

P-40 FLYING TIGER — 18" span, all balsa pre-fab for .049 engine. $3.50

LI'L JUMPIN' BEAN — 21" span Favorite ½A stunt model. $3.50

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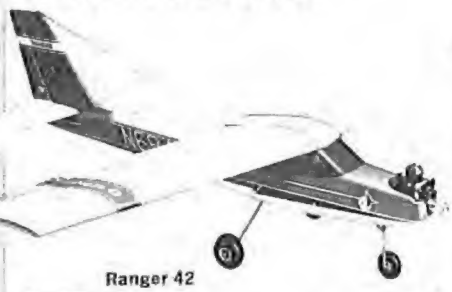
VOODOO — 36" combat-stunt for .19-.35 engine. ..... Single kit $4.95 Double kit $8.95

JUNIOR SATAN — 29" span, combat-stunt, for .15 to .19 engines. $3.95

LI'L SATAN — 19" span, ½A combat-stunt for .049 engine. $2.95

GRADUATE TO R/C!



RANGER 42 $19.95

CARL GOLDBERG MODELS INC.
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I am sending 20¢ for 8 pg. illustrated Catalog with "Recommendations in Starting in R/C," Basic Explanation of R/C Equipment, and Radio Control Definitions.

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Letters

Is Modeling Un-American?

I asked my coach (7th grade) about flying airplanes in the gym. He said in Russia they force kids to make model airplanes and I should stop because it isn't a good American thing to do. Is he right? My parents say maybe.

Tommy Higgins
Albuquerque, N.M.

Your letter reminds us of when we were in school. The science teacher told us that an airplane could not fly if the prop stopped. She said it would crash. She never knew that most planes will glide and she probably never heard of a glider.

Well she was wrong. She didn't like being told so. Adults can be wrong. No one is so smart that he knows all the answers. Your teacher is wrong. But you might just as well forget it. Here is some information anyway.

The Navy was host to the National Model Airplane Championships for 25 years. They made available for one week an entire air station and supplied hundreds of men to help. About 1500 modelers flew planes there including Radio Control.

The Academy of Model Aeronautics, a non-profit organization in Washington which makes rules, sanctions contests, etc., has over 40,000 members with an average age above 30. They have 800 major clubs and sanction nearly 2000 contests a year.

There are five magazines with a combined circulation approaching a half million. The model industry (manufacturers, etc.) has a volume of $50,000,000 a year.

Modeling is a sport as well as a hobby, and is indulged in by people of all ages. Junior American Modeler *for teenagers has readers all the way up to 82 years of age. Modeling teaches many skills, and sharpens thinking, because design, solutions to problems, structures, etc. require ability to learn and improve.*

At your age one should not go overboard, however, because school studies are important to one's future.

Model building is not playing with toys. Only the uninformed might think so. And it certainly isn't un-American. In fact, many schools have clubs and extra-curricular modeling activity.

—Editor

Building "Strange Stuff"

May I compliment you on Junior American Modeler. It is doing exactly the right thing in presenting an assortment of off-beat models, helicopters, canards, etc.—fun models that really work. For the past three summers I have been on the faculty of Holden Village, a family retreat center in the Cascade Mountains; while there I have gotten deeply involved with model building. I always have 15 or 20 kids building models at a furious pace.

For most of them, it's the first time they have ever seen a model really fly. I learned that most programs introducing kids to models go about it the wrong way. They start with basic models and gradually increase to stick and tissue, then contest, then scale, then unorthodox. The kids want it just the other way. They want to build the strange stuff right off; they want funny flights. Later, after they come to appreciate modeling, they also come to appreciate the more orthodox models. Your magazine, needless to say, got a lot of use last summer. I wish it had been around earlier.

Roald Tweet
Rock Island, Ill.

Uses Handy Hints

I am 14 years old and my plane is the "Ringmaster J.R." profile control line model. The wingspan is 30 inches and takes .09 to .19 engines.

A Fox .15 is mounted on my plane and it has been covered in white Mono-Kote. The Ringmaster J.R. can be purchased at any hobby store. All the special techniques were taken from "Handy Hints" in Junior American Modeler.

Mike Allen
Indianapolis, Ind.

(Continued on page 50)

What's Your Question?

ERIK R. KUGLER

Q: I am a beginner, and I don't know much about radio control. I want to build an RC car, but I don't have plans. Also, I want to know where to get an inexpensive beginners RC set. Could you tell me where to get some plans for a car, or recommend a radio control set?

Tim Miller
Plandome, N.Y.

A: Your letter is typical of many we get. Let me try to answer your questions one at a time. First, I would recommend that you find out more about the specialized area of modeling called RC Car Racing. Fortunately, there is an inexpensive book available that will answer many of the questions that you now have and will have as you learn more about RC cars. This book is "Getting Started in R/C Car Racing" by George Siposs. It sells for only $1.25, and is available from the publishers of JAM. This book is right up to date too. It was originally published in 1972, so many of the ideas are still current.

After you read the book you may not want to have your initial project be one that is built from scratch. In fact, there are many fine complete systems on the market that include both the car and the RC equipment. Many of these outfits are nearly ready to run right out of the box. Once you have learned all of the basic principles, then you can build a car that meets your needs.

Asking for an inexpensive beginners set poses some problems. You will need a digital proportional set. To make a long story short, it will cost you about $100 at a minimum to get a complete outfit that will do what you have in mind. Picking an RC car outfit is a very personal thing. For me to pick one for you would be like me picking a best friend for you. Please read the advertisers in JAM, and, if you have a copy, in American Aircraft Modeler. Also see what types of outfits the fellows in your area are using. If you get something similar, they can help you get started. If all else fails you can write to the manufacturers of complete RC car outfits for promotional materials, and compare for yourself what is on the market and what you can get for your money. If that does not work send a self-addressed stamped envelope for a catalog to Bo-Link Industries, Box 80653, Atlanta, Georgia 30341.

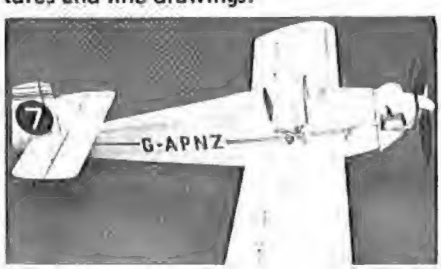
Q: What is meant by "Peanut Scale?" Every time I pick up a model magazine I see pictures of these neat airplanes, but I have been unable to find out anything about them from the articles. Could you please give me some information about how to get into this type of modeling? I am 16 years old, and have been building and flying model airplanes for two years.

Kit Berger
Annandale, Va.

A: In our society it seems that the common thought is that the larger something is, then the better it must be. Now a group of modelers are changing this attitude. Peanut scale is primarily a type of rubber-powered, scale-model airplane. These models are the newest development in flying scale. All have very small wingspans in the 10- to 13-inch range, and they are as detailed as you care to make them. They have several advantages for today's modeler. First, they are very low in initial cost. Second, they are easy to build and transport. Third, they cost next to nothing to operate, and require no equipment other than a finger to wind the propeller. Last, since they make no noise, they can be flown almost anywhere.

I would recommend that you start in this type of modeling with a kit, and then progress to plans after you have built several different kits. One source of kits with national distribution is Peck-Polymers, P.O. Box 2498, La Mesa, California 92041. Currently, there are three kits they manufacture, and all are excellent. The plans are excellent for the beginner. They include pictures illustrating each step of the construction process. The photo below is of their newest release, the Druine Turbulent.

When you are ready to build from plans the foremost designer and artist is Bill Hannan. The cost of these plans is under $1.00 each, with most costing $.60 to $.75. Bill's catalog costs $.25 and is available from P.O. Box A, Escondido, California, 92025. The price is right, and the beginning modeler will enjoy just looking at the beautiful pictures and line drawings.



Q: Thank you for a fine beginners magazine. I am a 27-year-old beginner, and I have found your magazine a fine help. I have been trying to get started in RC. On my first attempt, I demolished my airplane. Perhaps you could run an article on beginning in RC, including the first flight. It's a real problem without having an experienced modeler to take the controls. Also, where can I get RC insurance?

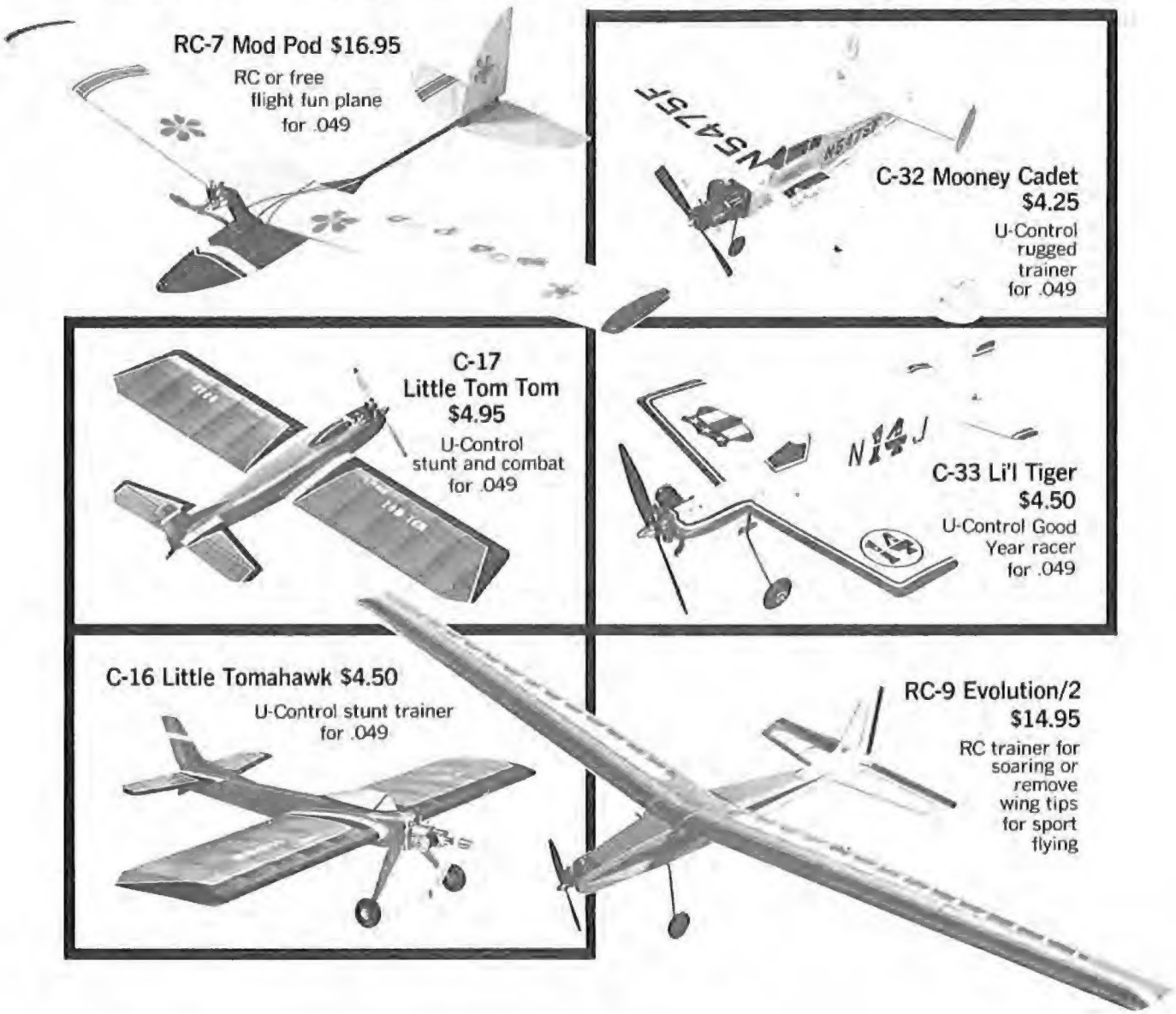
Dennis E. Jaques
Coldwater, Mich.

A: To answer your most important question first, Dennis, RC insurance is available from the Academy of Model Aeronautics, 806 Fifteenth Street N.W., Washington, D.C. 20005. In addition to the other benefits that one gets as a member, the limits of protection under the AMA insurance policy are $300,000 per accident for bodily injury and/or property damage during all model flying activities whether competition or sport, except that the first $100 is deductible (concerning property damage only) when an accident involves one AMA member with another. The deductible condition does not apply when an accident involves an AMA member with a non-member. For the full details about the insurance policy and other AMA member benefits please drop a line to AMA.

Concerning the bad luck you are having getting off the ground, you have recognized the best approach—having an experienced modeler help. Where this is not possible I suggest that you start simple. Be sure that you have a trainer type aircraft, and a minimum number of controls. Actually, I recommend that beginners start with a single control on the first plane. I prefer rudder control only on an inherently stable ship. Flight should be trimmed so that the model climbs slowly under power, and then glides slowly once the engine quits. I generally prefer an .049 powered model for this, as they hold up much better when meeting the ground. Use this initial model for getting your senses oriented to a model flying overhead. For your second control add elevator. This is a relatively easy step. By this time you should be ready to proceed to the type of aircraft that you probably started out on.

(Continued on page 54)

EASY TO BUILD EASY TO FLY... AND DUMAS MAKES 'EM EASY TO BUY



What's more, it's **really** easy to have fun with our Dumas model plane line as well as our famous red and white checkerboard boxes you've seen in your favorite hobby shop.

And you don't have to sign up to cut every lawn on the block to get one of these high performance kits. Instead, you'll spend your time having the fun of building . . . and **flying** your own airplane.

You get clear, easy-to-follow plans that make model building a breeze. And each kit comes with cleanly die-cut parts of high quality balsa, plywood and hardwood.

dumas planes

Dumas Products, Inc., 790 South Park Avenue, Tucson, Arizona 85719

Whether you're about to start your first flying model or are moving up to a radio control beauty . . . or perhaps are even thinking of getting your feet wet with a model boat, there are more than 85 Dumas kits for you to choose from.

To get in on the fun, check out the many attractive Dumas kits at your hobby dealer or send 25¢ to cover postage and handling for our complete catalog of model planes and boats.

Whippe

Whip control is great for stunting, combat, balloon busting, speed, formation flying—all without an engine.

JOHN HUNTON

Flying two in a circle can be way out—especially in a Combat match. It's terrific training for flying high-performance powered jobs later on. Do you suppose that peaked cap covered his eyes before the bout was finished?

rsnappers

Whip models are the basic form of control-line flying. Many of the maneuvers performed by the more sophisticated control-line models can also be performed by the simple whippers. In fact, the Whippersnapper is a logical step toward introducing the beginner to the basics of control-line flying. The Whippersnapper can provide the experienced filer a broader challenge in the mastery of flight.

Now you are sold, let's get to the construction.

Four (4) Whippersnappers can be constructed from one sheet of 1/8 x 3 x 36" balsa, two (2) ¼ x 1/8 x 36" hardwood sticks (or two (2) 1/4 x 1/4 x 36" pieces of balsa), glue, and modeling clay.

Place all wood over the accompanying full-scale plans and trim to size. Lightly round off indicated edges with sandpaper. Mark off location of wing and stabilizer on the twin booms. Using white glue (or model airplane cement), bond entire model together and allow to dry. Decorations may be added with a felt-tip pen. Add modeling clay to the forward end of the outer boom until balance is obtained, close to the leading edge of the wing. Secure a length of heavy thread (or light string) to a control stick. The stick should be 2 to 3 feet in length. The string or thread should be cut to length so that when it is secured to the model, the model will barely clear the ground with the arm and stick extended vertically above the head.

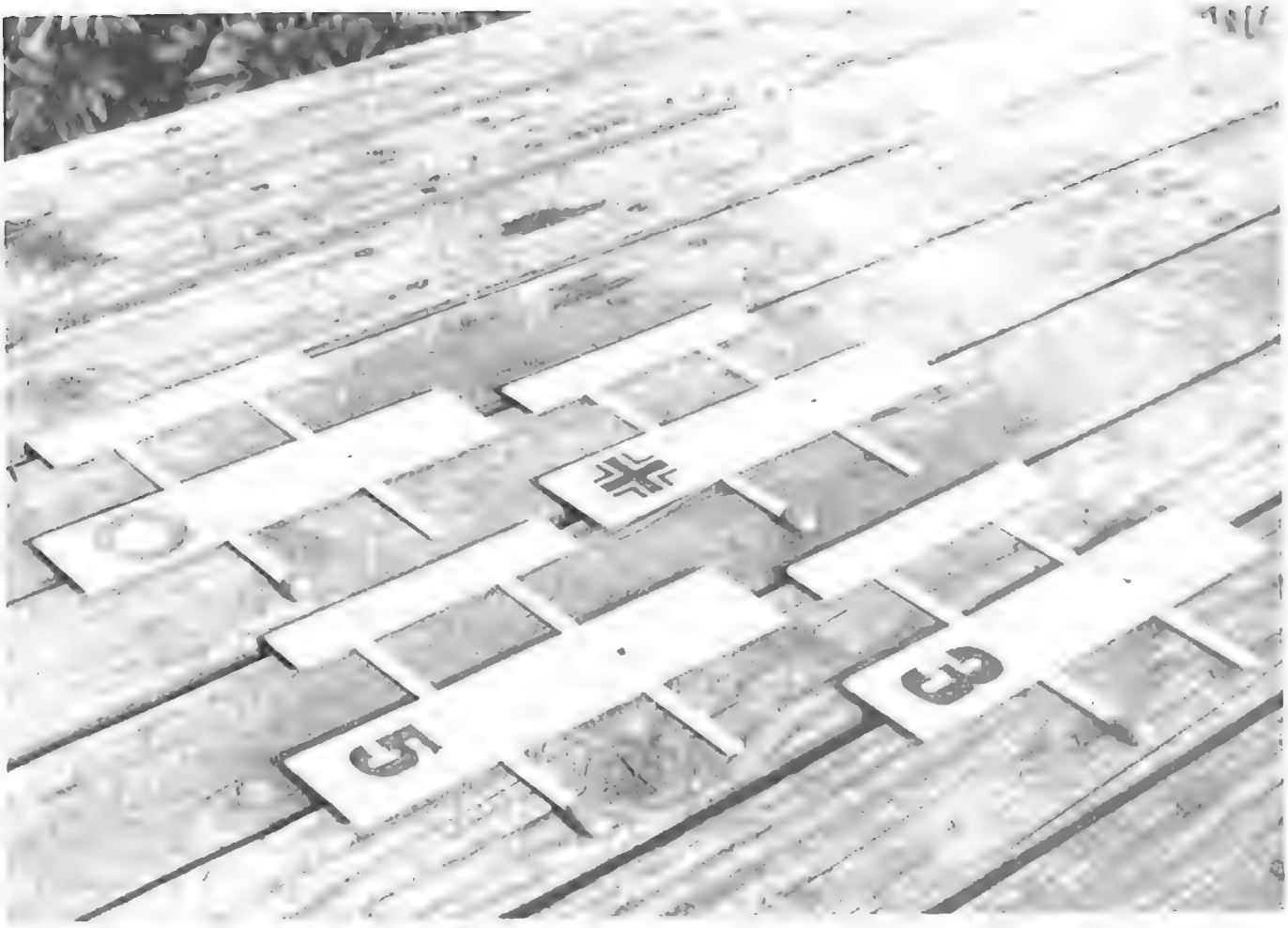
And now for your first flight. Begin flying by leading the model with the control stick. Flying toward your left (counterclockwise), the model is considered upright. At first, turn with your model. When flight is obtained, swing the stick in a rotary motion around your head to sustain flight. Wind will have a significant effect on the flying characteristics of the model. Going into the wind the model will have a tendency to rise; downwind, to drop. Wind effect can be countered by lowering the control stick when flying into the wind and conversely, raising the stick when flying downwind. If control is lost, don't panic, simply raise the control stick to keep the model from crash landing.

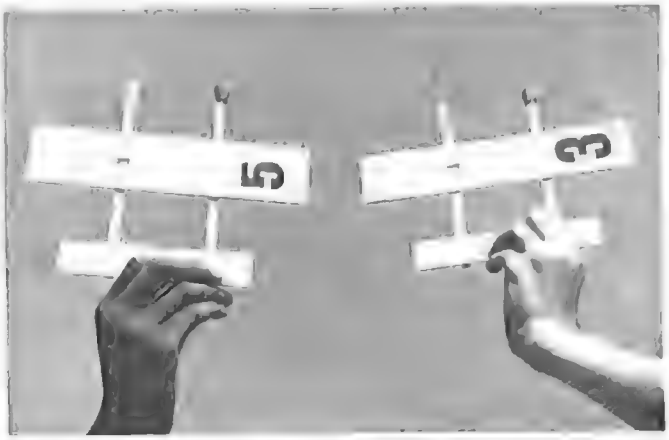
When you think you have mastered the basics of flying with the wind, you are ready to put the wind to work for you.

Stunting: Removal of small portions of nose weight from the boom will make the Whippersnapper more maneuverable. Instability will result if you take off too much weight. Experiment until proper trim is obtained. With the wind at your back (to keep the line taut) the Whippersnapper can easily be led through consecutive loops. To stop looping simply stop whipping. If speed is reduced while performing consecutive loops, so that the Whippersnapper is going very slowly at the top of the loop, you will find that you have gone to inverted flight. Direction of flight can also be reversed by starting the model in either direction. The horizontal figure-eight will prove to be one of the more difficult maneuvers. To perform one, begin a slow loop, switch to inverted flight. Begin another loop (inverted position) and recover in upright position. Experience and perseverence are required to perfect the figure eight.

To obtain an increase in speed, noseweight must be added until the model hangs level from the tether line. As flying skill is increased, you can have hours of fun with the following maneuvers.

This is the sort of thing that inspires rumors of flying saucers and little green men. Looks fast? It is! Balance clay on right nose has the look of ominous radar.





Top: You, and your friends, can build a zillion of 'em, but, alas, that would take a lot of balsa. Decals, numbers, what have you, identify individual aircraft. Above: A picture is worth a thousand words—you are looking at the works. If you wish, get fancy. Vary the tip shapes—just a little—and add a profile cockpit or fin. Decorate with a felt-tip pen.

Combat: Prepare your model by tying thin crepe paper strips to the outer boom close to the stabilizer. Nose weight may be added to compensate for the additional tail weight. Naturally, two (or more) contestants are required for combat flying. In friendly combat the models are flown within the same circle, each contestant and model turning together. The object in friendly combat is to touch your opponent's streamer. On the other hand, in killer combat, the object is to cut the opponent's streamer. The flight routine is also different. Separate circles that intersect at one point are flown. In killer combat flying, it is advisable to have extra Whippersnappers on hand.

Balloon Busting: Another competitive sport is balloon busting. Tie a balloon onto a stick and secure the stick into the ground. The object is to break the balloon with the Whippersnapper in a minimum number of laps.

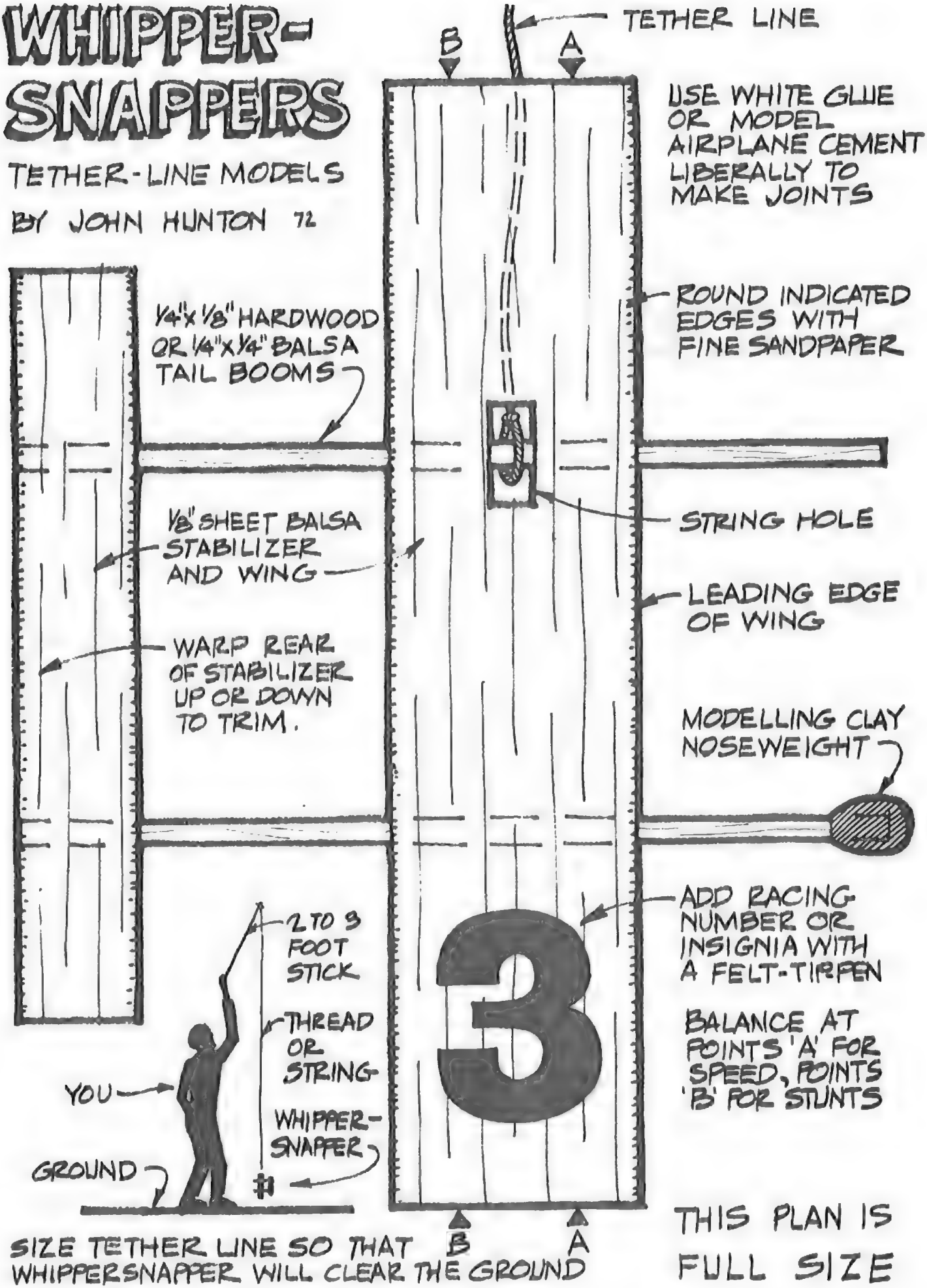
Formation flying: This takes a little coordination on the part of each contestant. Flying the same circle, maneuver the models as closely as possible. When you think you have mastered this, try flying formation from intersecting circles.

Control-line flying began with the tether line. This return to the basics can give you and your friends many enjoyable hours. Happy Whippersnappering!

WHIPPER-SNAPPERS

TETHER-LINE MODELS

BY JOHN HUNTON 72



HOW SAILBOATS WORK

GEORGE SIPOSS

The sun is high above the horizon and the puffy, white clouds float lazily. A gentle breeze teases the surface of the lake, a few ripples appear here and there and the waves gently support a model sailboat as it goes bobbing by. You sit there on the shore and watch the colorful sail strain against the mast. Sailboats are a peaceful thing.

Thousands of years ago, one of our ancestors noted that wind would drive leaves along the top of the water. The bigger the upright part of the leaf, the faster it floated along. Man is able to connect ideas together in his mind. He fashioned a frame from sticks of wood and he stretched a light piece of animal skin on it. When he attached this "sail" to his dugout canoe he found that he could afford to sit back lazily and let the wind do the work for him. The idea of low-cost transportation was born.

Soon large barges were built and equipped with canvas sails. Then the idea was applied to warships, trans-oceanic clippers. For centuries the only method of long distance over-water transport was by sailboat. But these boats were slaves of the wind. They could only run "before the wind" which means that they could not run sideways or towards the source of the wind. Less than a hundred years ago some far-thinking men had applied modern concepts of "vectors" and "airfoils" to sails and succeeded in making boats which could perform the seemingly impossible—head almost straight into the wind!

How does a sailboat work? To begin with, sailing is much more than hanging a piece of cloth on a mast and waiting for a good breeze. Designing a boat, and controlling one, is an art. First there is the hull.

The hull displaces water and, according to the law of Archimedes, it will float as long as the hull (and whatever is in it) weighs less than the water it displaces. For example, take a model boat hull which displaces one-half cubic foot of

Radio controlling your own yacht is the ultimate in modeling experience. With or without radio, sailboats are most pleasant to build and operate.

Above: Skippers of this "Sunfish" lean out to counterbalance the pressure on the sail. Dumas has a simple, colorful, operating scale Sunfish kit. The sail is red and white, ready to use. Sterling's Skippy also is a natural.

Left: Changing the sail setting can mean the difference between winning or losing a race. This young skipper looks as if he knows what it is all about. Many plane builders like to have a nicely-finished sailboat standing about. Fun at a family picnic at a nearby lake.

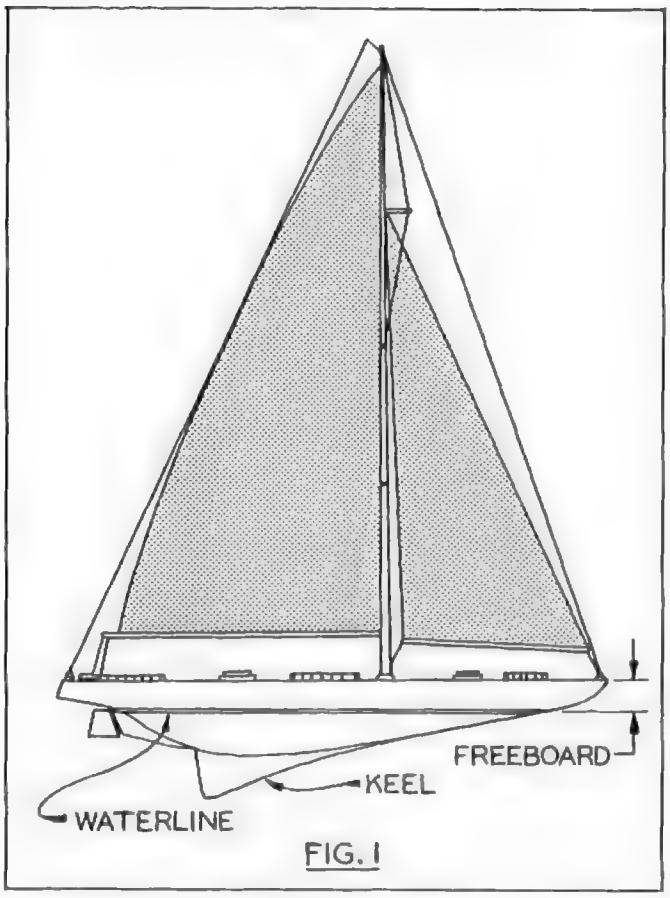


FIG. 1

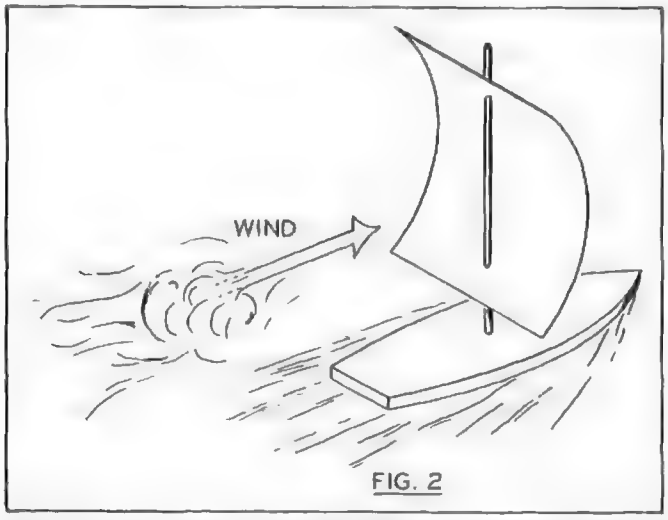


FIG. 2

Top: First of all, there's a mess of new terms to become acquainted with—if you don't wish to sound like a landlubber. This drawing illustrates hull terminology; so far, so good. Above: Well, this looks simple enough—also representative of your editor's present skill level.

Opposite page, top: Just knew there had to be more terms. Master this and you'll be able to talk as casually as the Captain of a China Clipper—well, almost. It's not worse than decalage, incidence, and all that stuff. Opposite, bottom: It's probably not news that the wind direction can be from the side, or even a bit from ahead—and the sailboat slides along. If you want to understand the mechanics of it, this figure gives quick impression.

water. Since a cubic foot of water weighs 62.4 pounds, the boat hull will be bouyed up by a force equal to half of that, or 31.2 pounds. If the hull, the sails, the keel weight, etc. weigh 25 pounds for example, there is a force of 6.2 pounds left over. In order to balance this, the hull will float higher in the water so that it will displace less than one-half cubic foot. What this means is that there will be some "free board," that is, the amount of hull visible above the waterline. If you remove some weight from the hull it will float higher in the water and vice versa. (Fig. 1.)

Modern hulls are made very streamlined and smooth. This is because the water, rushing by the sides of the hull, creates a tremendous amount of frictional resistance which tends to slow the boat's progress. Look at it this way; there is a certain amount of driving power available from the wind-driven sails and, the less resistance there is opposing it, the faster the boat will go. At the bottom of the hull there is a keel, a flat extension of the hull which keeps it going straight as well as providing a place where we can attach some weight. Keel weight is added to counterbalance the weight of the sails and the pressure on them, so that the boat will not capsize. Since the keel weight also displaces water, its actual weight in the water is less than that in the air. For this reason there is always seemingly more weight added to the keel than seems necessary. Some model sailboats carry as much as 20 pounds of lead in the keel.

Fiberglass hulls can be shaped to provide an ideal shape underwater, much like the body of a fish. A well-finished hull should be glassy smooth. If your boat is made from wood (varnished) you can apply wax to polish it to a high sheen. If the boat is enameled or epoxy finished, it needs less maintenance, but you will be surprised how much faster it can sail if you apply a little bit of furniture polish to the outside of the hull.

Now, for the theory of sails. Most young people, at one time or another, have made a simple boat with a square-rigged sail on it. This kind of sail does not really run well unless the wind blows from directly behind the boat. (Fig. 2.)

A modern model sailing yacht has a tall mast. Obviously a tall mast is able to carry more sail and yield more potential speed. If we were to make the mast from very heavy material, the boat would be top heavy. So, we use a slender rod or tube and, to make it strong, we attach lines to it to brace it. There may be lines running from the tip of the mast to the boat deck, or from halfway up the mast to the deck. Additional rigging may be added as required.

Now we are ready to attach a triangular sail. The main sail is the large piece of canvas located behind (i.e., towards the stern) of the boat. There is always a smaller sail in front of the mast (on racing yachts). This is also a triangular sail and it is called the jib. The function of the jib is to catch more wind and, mainly, to channel more wind onto the main sail. A boat rigged with a triangular set of sails in this fashion is called a "sloop." (Fig. 3.)

In order to understand how the main sail works, let us consider an example. If you put a wedge-shaped wooden block on a smooth surface and press down on it, you will find that it moves sideways as illustrated in Fig. 4. If you use a block with a more blunt angle, it will still move sideways but it will also tend to move with more difficulty because there will be more friction generated between the block and the table surface. Now, if you use a very flat block it may not move unless you make sure that there is very little friction between it and the table (such as by attaching wheels to it) and that there is little friction between the force applied and the inclined surface.

The above example can be applied to boats. Imagine that instead of looking at the block from the side, you are looking at a sailboat from above. Now, instead of an inclined plane of the blocks, we have a sail, and instead of wheels supporting the block, the boat is floating in the water and is able to move. In the block example the table surface ensured that the block can only move in a straight line. In the case of the boat the straight keel makes sure that the boat will move in a straight line.

There will come a time where no matter how well you build the block (or the boat) no amount of force will cause it to move forward. The better the boat the smaller this angle will be. A good boat is not only able to move sideways to the

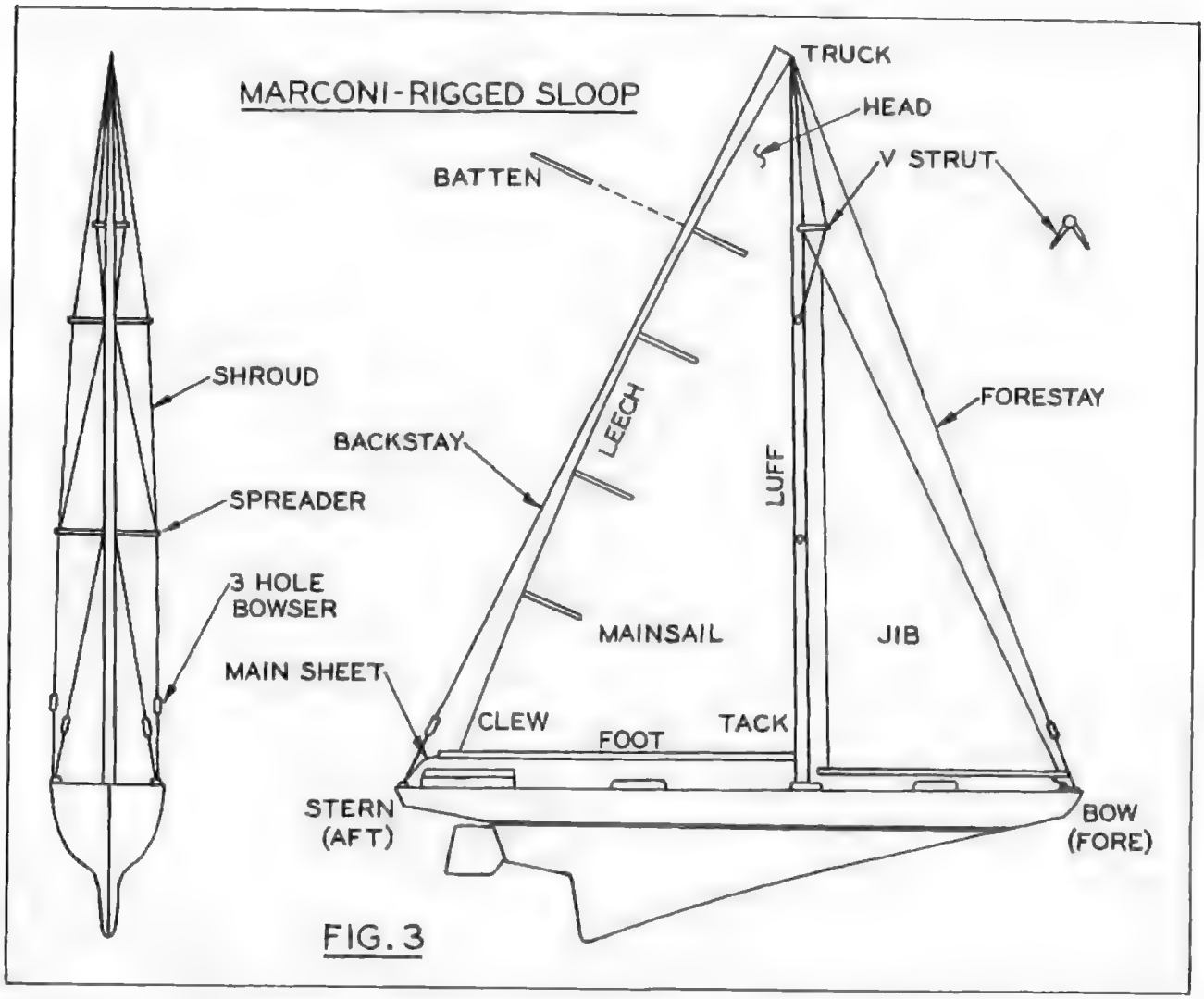

MARCONI-RIGGED SLOOP
TRUCK
HEAD
V STRUT
BATTEN
SHROUD
FORESTAY
BACKSTAY
LEECH
LUFF
SPREADER
3 HOLE
BOWSER
MAINSAIL
JIB
MAIN SHEET
CLEW
FOOT
TACK
STERN
(AFT)
BOW
(FORE)

FIG. 3

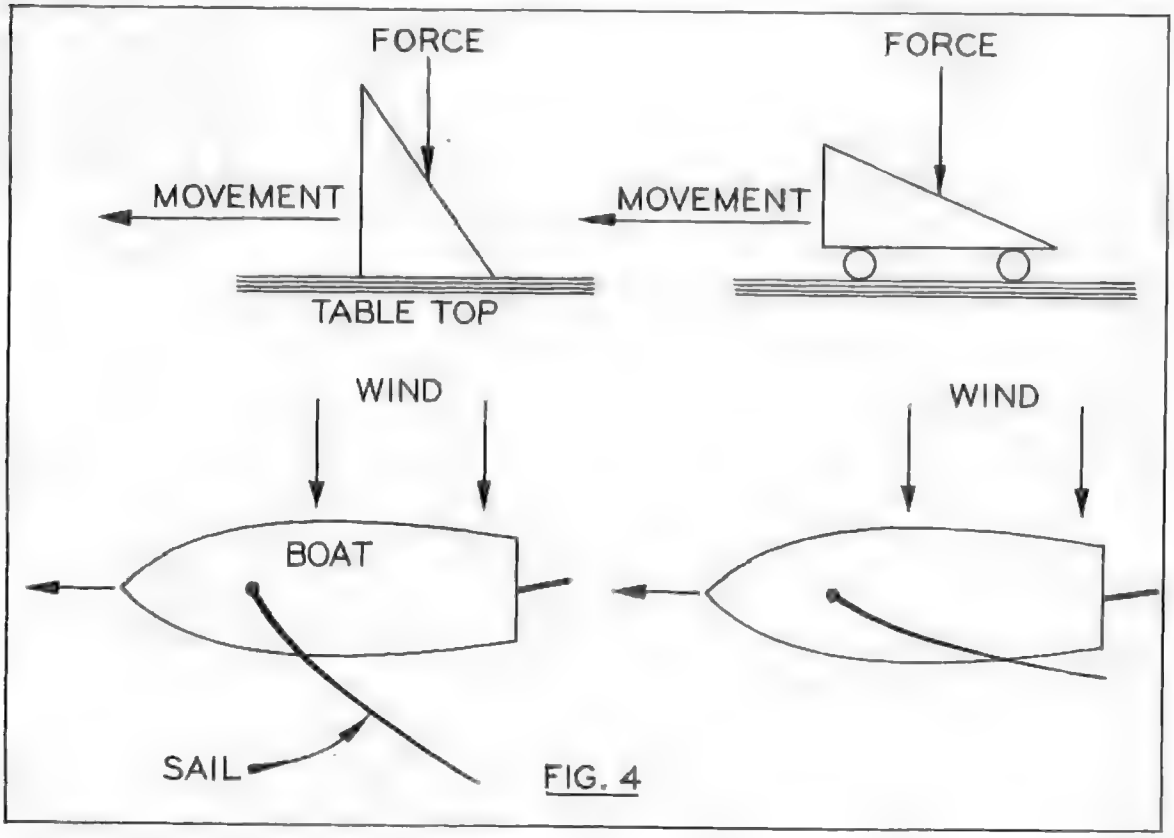

FORCE
MOVEMENT
TABLE TOP
FORCE
MOVEMENT
WIND
BOAT
SAIL
WIND

FIG. 4

Tacking into the wind. Just because the wind is from dead ahead doesn't mean you have to stay at the dock. Of course, this type of sailing is absorbing when radio control is possible. Bottom: Running before the wind is illustrated by this fan—and the kind of sail you'll be working with.

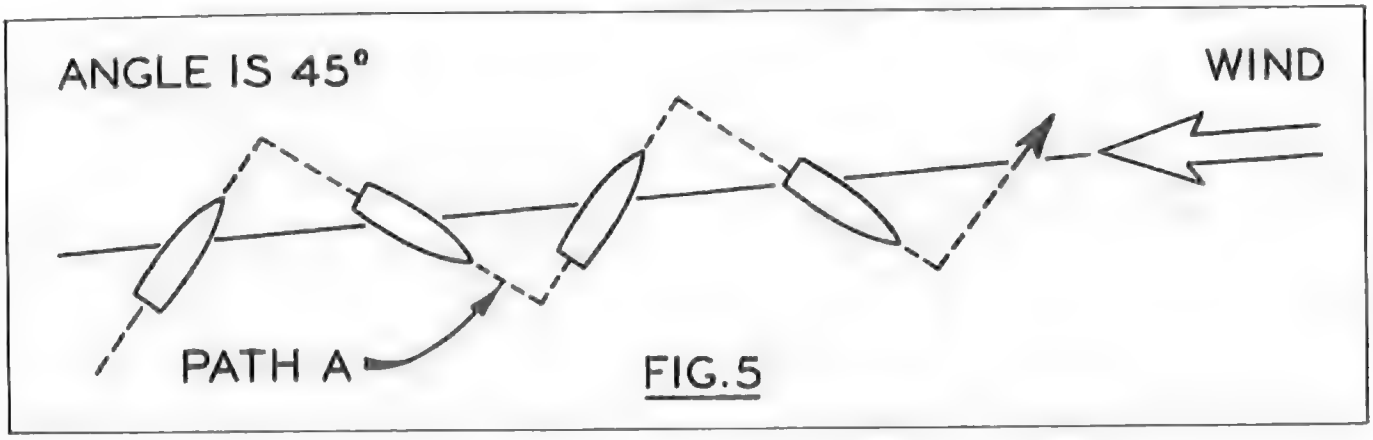


FIG.5

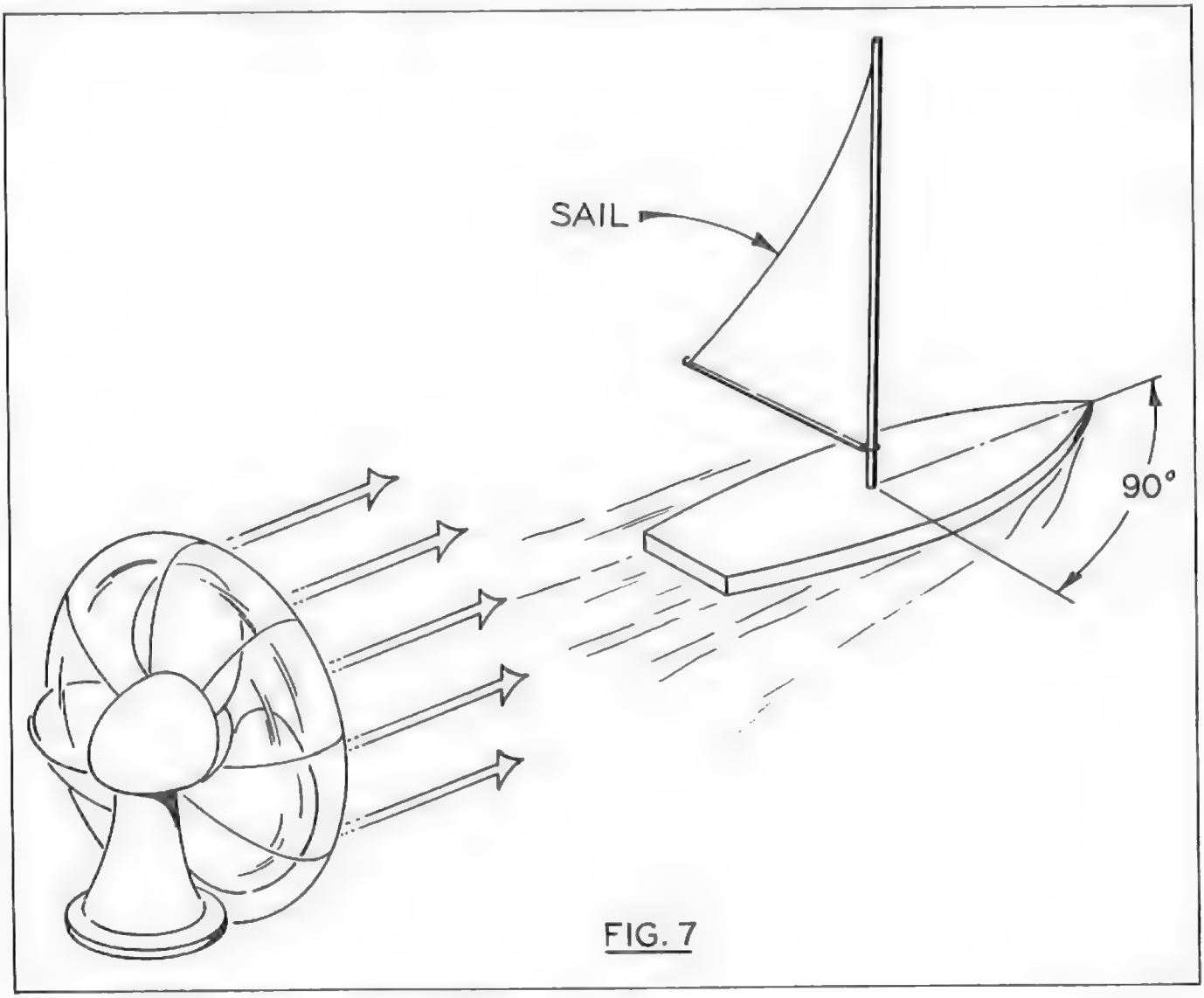


FIG. 7

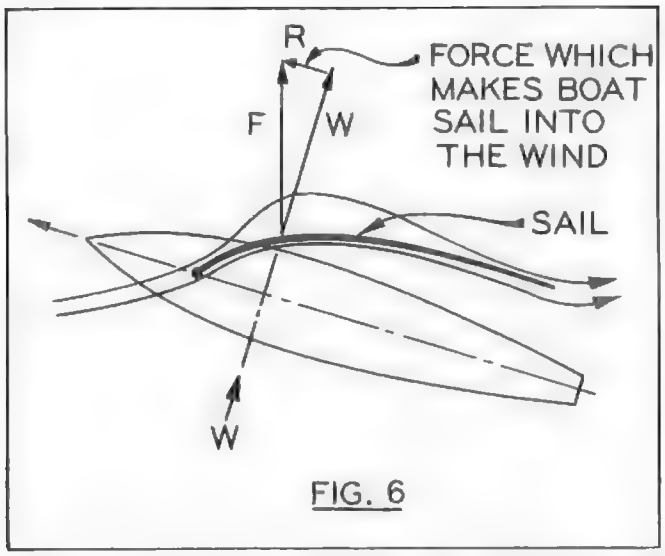


FIG. 6

wind but point towards the wind as well. Some boats can point towards the wind by as little as 30 degrees. Now it becomes clear that, while you cannot sail directly towards the wind, you can sail roughly in the direction from where the wind is coming and, by zig-zagging, you actually make headway in that direction. (Fig. 5.)

The example with the blocks was based on flat surfaces. Now, we all know that even a flat-surfaced model plane wing will fly but even the Wrights knew that a curved surface works better. The cross section of a sail under wind load is much like that of a curved airfoil in a glider. This shape insures that the air flows around the sail without turbulence. (Fig. 6.)

Now it should be quite clear that, by steering the boat by the tiller and adjusting the sails accordingly, one can sail in almost any direction. You can prove this to yourself by assembling a cheap little sailboat and aiming a fan at it. You will be able to feel the driving pressure generated by the wind. Turn the boat so that the sail is at a 90-degree angle to it and let the fan blow from behind. (Fig. 7.) Now the boat will sail at the same speed as the wind because it is carried along by it.

Turning the hull sideways to the wind and pulling in on the sails, you will feel a force trying to push the boat forward. This is best explained by a sketch showing the forces on the sail. One force is the wind, represented by a vector arrow "W." (Fig. 8.) Since the wind slips on the sail, the force that the sail feels is represented by an arrow "F." If we picture the combined effect of these two forces we see that they act the same as if only one force acted on the sail—the arrow labeled "R." This is the force which pushes on the sail towards the bow of the boat and causes it to move. As the sail is pulled in tighter, the relationship of these forces is altered and, you can prove mathematically, when the boat is sailing sideways to the wind, it can actually go faster than the speed of the wind. Only the friction of the hull in the water prevents the boat from going even faster. Wheeled land sailers or ice boats have much less resistance (ice boats have ice skates for runners) and by properly setting the sail angles one can sail at almost three times the speed of the prevailing wind!

If you set the sails on your low-cost sailboat and adjust the angle of the rudder, the boat will sail in a straight line. You can have contests this way: pick a target on the other side of the lake and see whose boat will come closest to it.

If you have radio control in your boat you can, of course, perform all of the standard sailing maneuvers. The sail can be preset and you need only to control the rudder by remote control. For highest speeds and best control you should also remotely control the sails.

So this is the story of how sails work. You need only very simple parts and a sailboat can be put together in a matter of hours. On the other hand, you can spend hundreds of dollars on a super smooth radio-controlled model yacht and race hour after hour. Whatever the case, you will have lots of fun. As we said before, sailboats are a peaceful thing.

Left: The Wright Brothers thought a wing was like a sail, and here's why. An airfoil-shaped sail works most efficiently—creates more lift, so to speak. Sail section looks like rib of a bird wing, doesn't it? Below: Getting into deep water, ahem. The combined effect of the wind, and the force that the "sail" sees, pushes the boat forward.

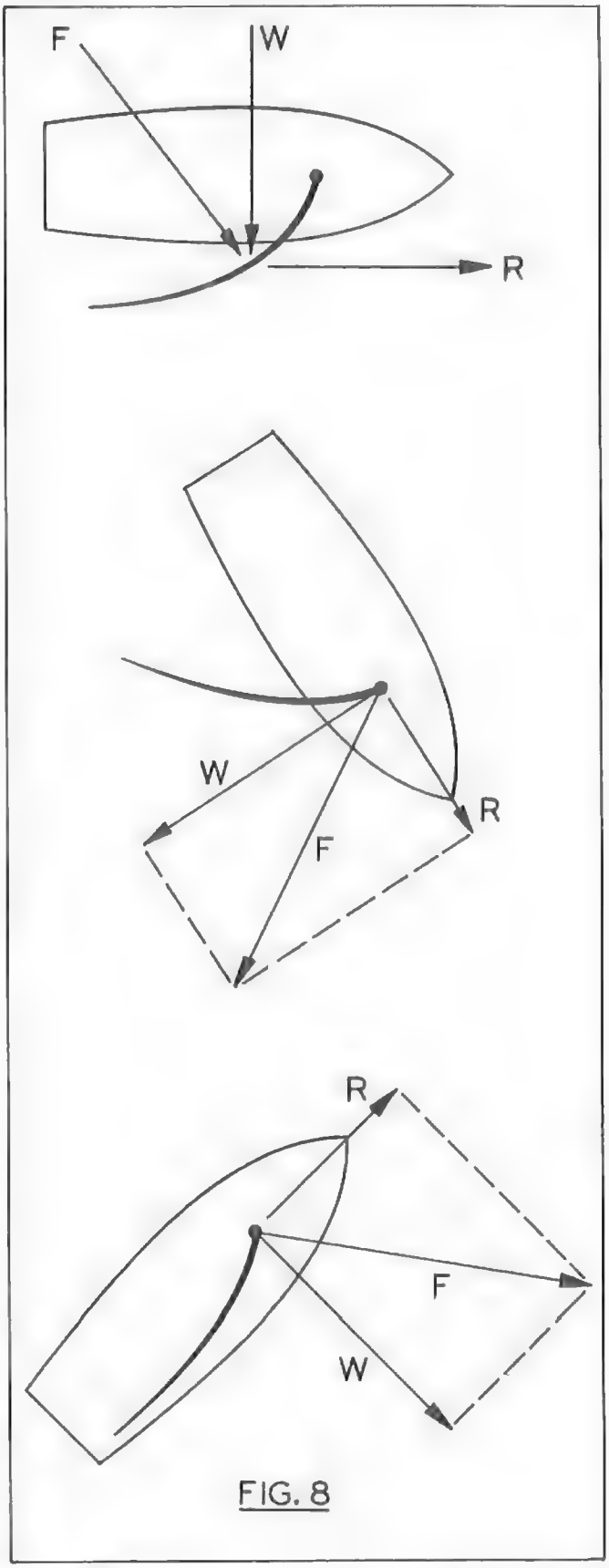


FIG. 8

NUPITER

A CHARMING FREE-FLIGHT TRAINER WHICH COSTS ABOUT TWO BUCKS TO BUILD–PLUS ENGINE!

TED SCHREYER

One of the real joys of modeling is watching a model that you have built climbing high into the sky, then gliding slowly back to earth in wide circles after the engine stops. But a beginner may have a difficult time getting his first gas model to perform like that.

The author's first free-flight gassie many years ago was a sad disappointment. It never got higher than the hand launch, and then headed for the ground like a homesick gopher.

Little "Nupiter," however, should be close to a sure-thing for a beginner. It was designed specially for my son as his first free flight, and has proven to be easy to build and fly. It also is inexpensive, with the materials costing only about $2. The Cox .02 Pee Wee engine (about $5) can be used later on for other models, and will last for many years provided it is given reasonable care.

Before beginning the model, study the plan carefully. Read the notes and suggestions on the plan since these hints will save time and trouble in making a good model. When building on the plan, cover it with a sheet of Handi-Wrap or similar plastic to protect it from glue. Place the plan on a flat building board of soft pine, gypsum board, etc. so that pins can be pushed into it.

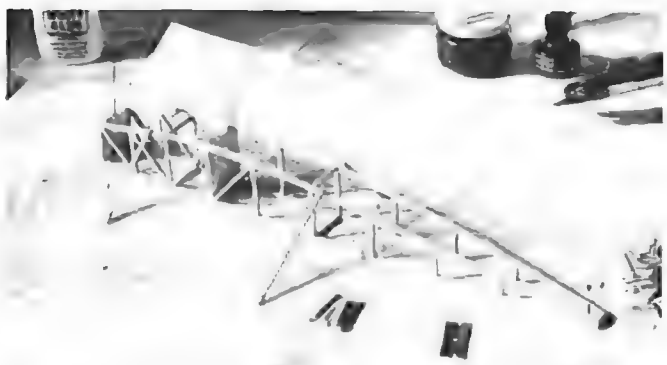
Choose good quality balsa wood, medium to medium hard and as straight as you can find. White glue is used for wood-to-wood construction. Model airplane cement is used to attach the covering, and in assembling the tail pieces to the fuselage.

Fuselage: Begin by making a fuselage side from 1/8"-sq. balsa strips cut and pinned down in position on the plan and glued together with white glue. Use a sharp modeler's knife or single-edged razor blade to cut the balsa strips to the correct length, and make careful, tight joints. Use a pointed stick to fillet the glue around the joint. Let the side dry at least four hours, then remove from plan and build a second side.

During this time, pieces B (2) and C (2) can be cut out and the landing gear wire bent to shape. Sandwich the wire between the double dormer pieces with plenty of white glue between.

Pin the fuselage sides upside down on the plan top view, and glue in the completed landing gear formers BB and CC to

1 Fuselage sides are made one at a time by pinning down top and bottom pieces on plan—covered with wax paper to avoid sticking. Cut cross pieces to size and glue them in place.



2 Fuselage sides are mounted on top view, joined by the two principal bulkheads and cross pieces, then pulled together at the rear. Note temporary prop pieces for alignment.

3 Building this wing is as easy as falling off a log. Edges and spar are pinned in place, ribs glued in. Note double ribs, angled at center to match the dihedral. (Up-tilt.)

4 Finished fuselage showing landing gear wires, and the wing glued together at center, with each tip raised the proper height above the work board by convenient objects.

insure a rectangular cross section for the fuselage. Then add the rest of the 1/8"-sq. balsa cross pieces. When this assembly has dried, remove from plan and add the stabilizer incidence wedges and the plywood firewall. The incidence wedges are very important.

Use fine sandpaper and give the fuselage a light going-over to remove rough edges. The smoother and less bumpy the framework, the better the covering will look.

Cut pieces of Silkspan about one inch larger all-around than the surface to be covered. Cut slits where the landing gear wires come out. The fuselage can be covered with four long pieces, one each for the sides, top, and bottom. Work quickly and apply acetate glue (your model cement, not the fast-drying kind) to the outside edges of the area being covered, then lay the pre-cut piece of Silkspan on the part, keeping it flat outward to remove wrinkles or sagging.

When dry, use a razor blade to trim off the excess covering. When the fuselage is completely covered, use a Windex-type sprayer filled with water and lightly spray the entire covering. Let dry, and the Silkspan will pull up tight and smooth.

Glue on the wing saddles and dowels. Give the fuselage two coats of clear dope, allowing a few hours for drying between coats.

Use fine sandpaper to smooth off rough edges after doping. The third coat of dope can be clear to show the framework, or can be color. A bright color like red or glow-orange will help to locate the model in tall grass or bushes. Glue on the address label with your information and give it a protective coat of clear dope. Your model may be farther away than you think.

Mount the engine with small wood screws. Use small metal washers between engine and firewall on the left side, top and bottom, so as to point the engine slightly to the right. Wheels are held on by bending the end of the wire up, or by a solder blob.

Tail: Build rudder and stabilizer on the plan using medium-hard 1/8"-sq. balsa strips. Make clean and accurate cuts so that each joint is neat and strong. Fillet the glue around the joints. When completely dry, remove from plan and, using fine sandpaper, smooth and slightly round off the edges. Cover the rudder and stabilizer with Silkspan on both sides. The stabilizer covering has to be glued to the central member or else the rudder will tear loose.

Water shrink the covering as per the fuselage. Then, *before* doping either part, use acetate glue and attach rudder to stabilizer. When dry, glue this rudder/stabilizer assembly to the fuselage with acetate glue. Make sure the rudder is pointed straight ahead along the centerline of the fuselage. Use enough glue to make a good fillet around the front and rear of the stabilizer where it contacts the fuselage.

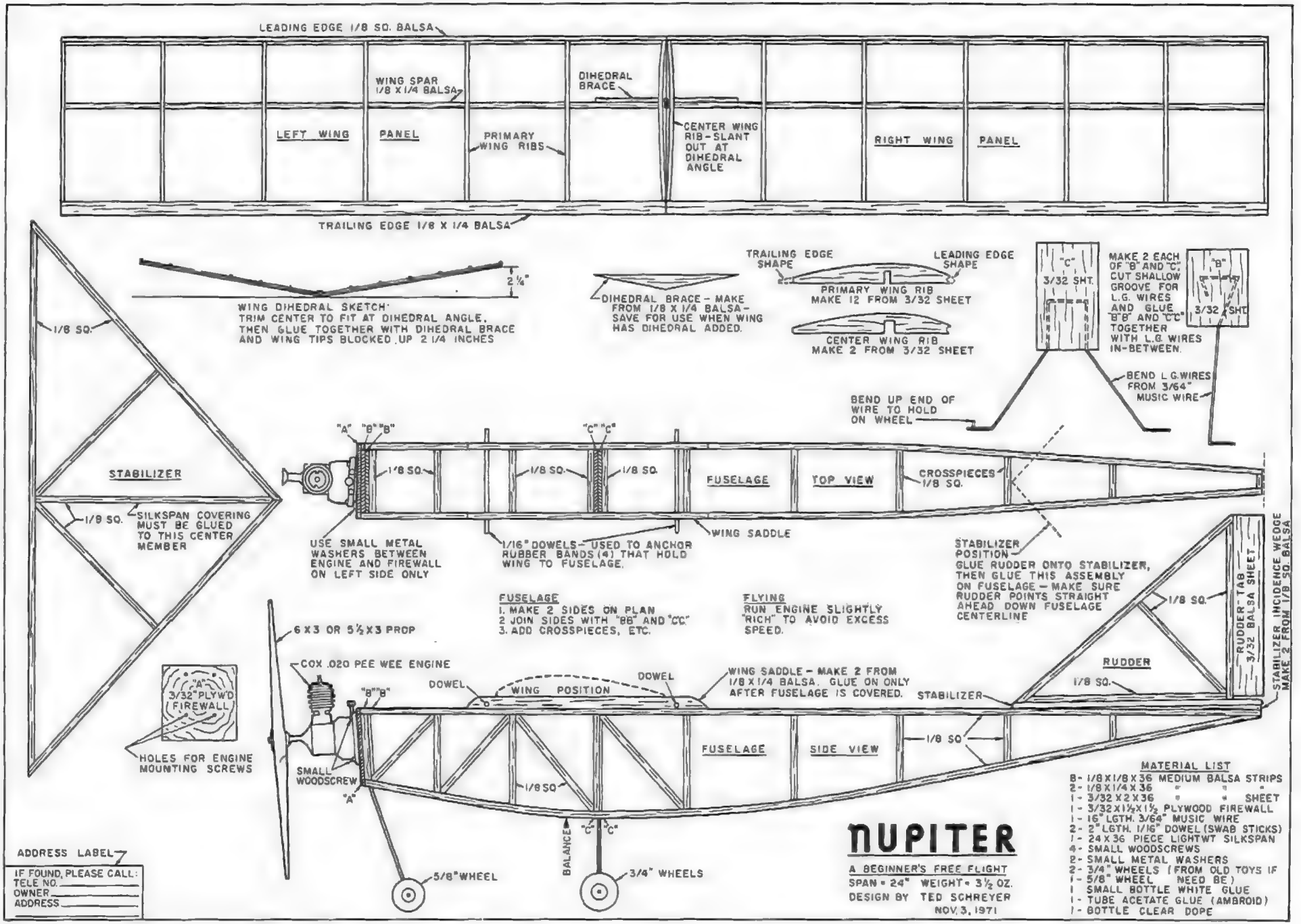
Dope the tail in the same manner as the fuselage. There will probably be a few wrinkles in the triangular tips of the tail, but this cannot be avoided with this construction and will not hurt the model's performance.

Wing: Carefully cut out the wing ribs. Cut the spar notches so that they fit snugly on the wing spar. Build both right and left wing panels at the same time on the plan. Center ribs slant out at the dihedral angle. Do not glue in dihedral brace yet. When panels are completely dry, remove from plan and trim center part of each panel to fit closely when wing is blocked up at dihedral angle. Then glue together at the center adding the dihedral brace and block each tip up 2¼ inches and let dry.

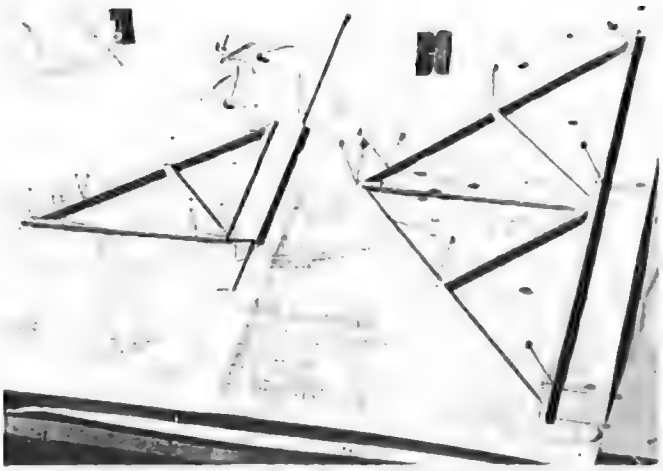
Use fine sandpaper to round off the leading edge and smooth the wing framework. Trim the trailing edge carefully with a razor blade leaving at least 1/16 inch material remaining. Sandpaper this smooth. Cover wing in a manner similiar to the fuselage. Water spray and let Sandpaper this smooth.

Cover wing in a manner similar to the fuselage. Water spray and let tight covering, so do a good job. Make a second wing if your first one turned out poorly. Dope as with the fuselage.

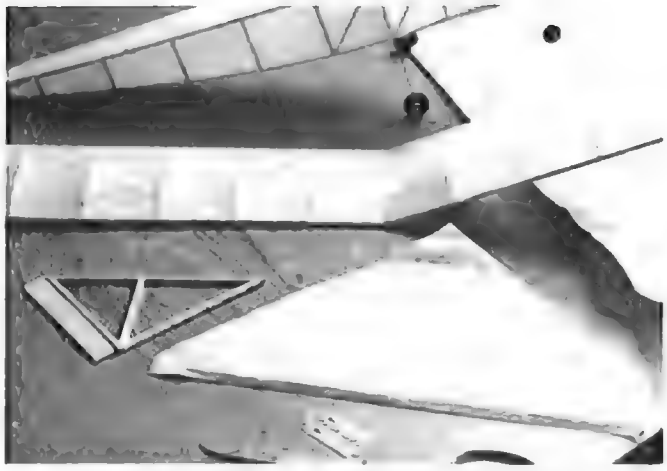
Pre-flight: Balance the model by holding a finger directly under the wing spar at each wing tip. The fuselage should come to rest horizontally. If the nose is down, add some weight (lead shot glued on) to the aftmost part of the fuselage. If the nose is up, add some weight to the nose.



FULL-SIZE PLANS AVAILABLE–SEE PAGE 58



5 Triangular-shaped flying surfaces are highly warp-proof. This fin and stabilizer are quite simple. Note how pins are driven into the work board at an angle—and not through the wood.



6 Covering tissue is applied with grain spanwise, or lengthwise. Otherwise it would bow downward between ribs, for example, and would tend to warp the surfaces when water-shrunk and doped.

7 How you hold a model to check its balance point—location of center of gravity in other words. Balancing according to plans or directions is vital—or model won't fly properly.

8 Yes it really flies swell. What could be more impressive than a well-built and flight-trimmed model—your very own—in a business-like climb? Tricycle landing gear great for takeoffs.

9 This young pilot must know a thing or two about his airplane to launch it this steeply! But a light toss straight forward may be safer—at least until you've seen how your ship flies.

Check wing and tail for warps by sighting from front or rear. Tail should be warp-free because of triangular construction. However, the wing may need the steam kettle treatment to eliminate a twist. Steam the warped panel for 10 or 15 seconds, then remove and twist in the opposite direction and hold until dry. Repeat until wing is warp-free.

From a slightly downward hand launch into the wind, the model should glide smoothly to a point 20 or 30 feet ahead. Don't worry too much about this as it is difficult to get a model to glide properly close to the ground.

If the Cox .02 engine is new to you, start and run it a dozen times or more before attempting to fly the model. The needle valve needs to be opened 3½ to 4 turns for starting, and a drop of fuel should be put in the exhaust port as a prime. Sometimes the engine needs to be primed and run a half dozen times to draw fuel from the tank. After the engine starts, turn down (in) the needle valve to "peak" it. But for flying, open the needle valve about 1/2 turn from peak so that the engine puts out only about 75% power.

Flying: Choose a wide-open space away from trees, and wait for a calm day (early morning or late afternoon are usually best). Use only about 1/4 tankful of fuel for each flight. or late afternoon is usually best). Use only about 1/4 tankful of fuel for each flight. into whatever wind there is. Nupiter should go off in a climbing turn to the left (right is okay, though). The model should continue in a climbing turn until the fuel is exhausted, then glide in wide circles (either left or right) back to earth.

Good flights depend mainly on getting a medium amount of turn in the power-on part of the flight. Too much turn

(Continued on page 52)

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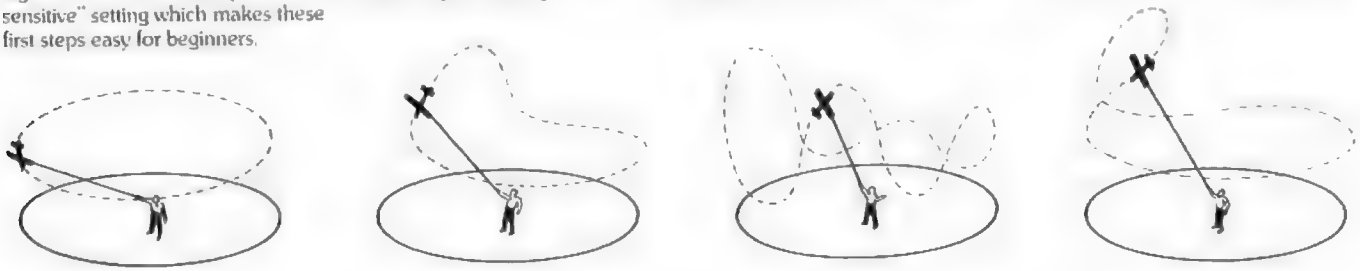

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THIS 'PAPERWORK' IS FUN— GROOVY TO BUILD AND FLY.

JOHN LUEKEN

FLY PAPER

During the winter of 1966-67 the *Scientific American* held an event that has already taken its proper place in aeronautical history, the first international paper airplane competition. Several of the outstanding designs were published by Simon and Schuster in *The Great International Paper Airplane Book*. The work recalled old memories of constructing paper model airplanes during the Second World War when balsa wood was virtually unknown in the pine and cardboard kits of the day. A bunch of us got together and developed semi-scale models featuring a built-up box-type fuselage and semi-symmetrical wing construction. All of these models were gliders without the refinements of landing gear or power.

Although the general cost of living has gone up, the renumeration for baby-sitting, lawn-mowing, etc. has remained pretty much the same since Grandpa's era. "Fly Paper" offers a practical solution for the beginning modeler who wishes to experiment with original designs at the lowest financial risk. Try it! If you don't like it—customize it!

Don't let the idea of an all-paper rubber-powered airplane lead you to the conclusion that it's in the same class as a fold-up paper glider. Although it will never perform like a contest ship, Fly Paper is an excellent machine to learn the fundamentals of trim adjustment since the flight surfaces can be easily altered. It is a fast and stable flyer that, unlike so many beginners' airplanes, seems to perform even better under fairly windy conditions. The prototype has survived collisions with houses, parked cars, and lighting fixtures of a school cafeteria.

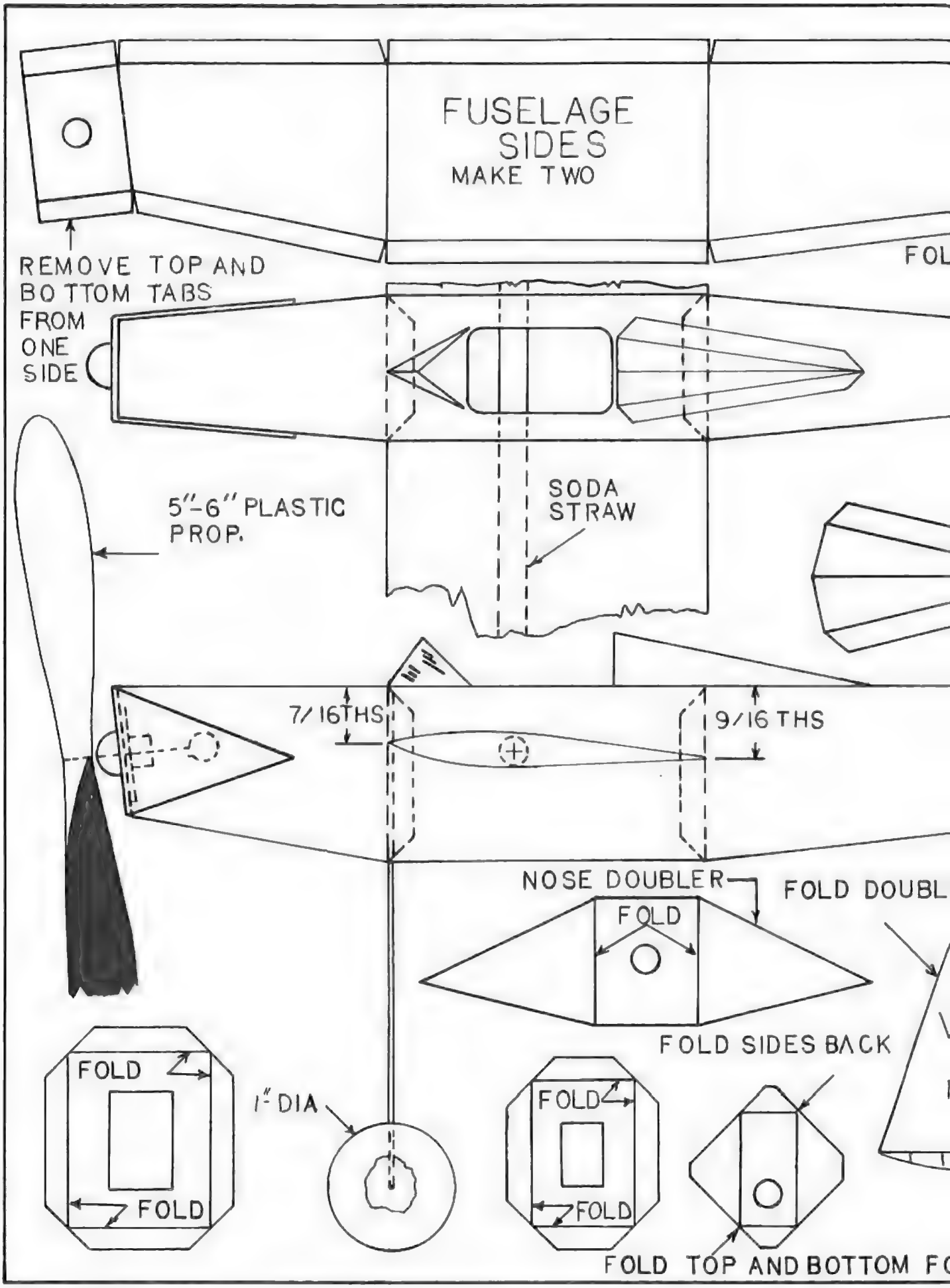
Please! Read the entire article and study the plans carefully before beginning. The most important and difficult part of construction when building this airplane, as with so many, is the fuselage. Once this has been accomplished the remaining work takes only a few minutes. This is truly a model airplane that can be built and flown in the same day.

The original was assembled from a type of graph paper that happened to be on hand at the time. When the writer began the search for a similiar type and weight paper he checked with various stationery stores and blueprint companies and discovered the closest was a 24-lb. weight paper. Although this seemed to be lighter in texture, the structure appears equally as strong and the flight characteristics obviously improved when the second model wound up on the house roof within a ten-minute period.

Construction begins with carefully measuring out two of the side patterns of the fuselage, remembering to reverse one side. Following the directions on the plans, score the fold lines with a *dull* knife. Join the two halves of the fuselage, overlapping the tail tabs with Ambroid or a similiar type airplane cement (I have found that white glue has a tendency to wrinkle the paper).

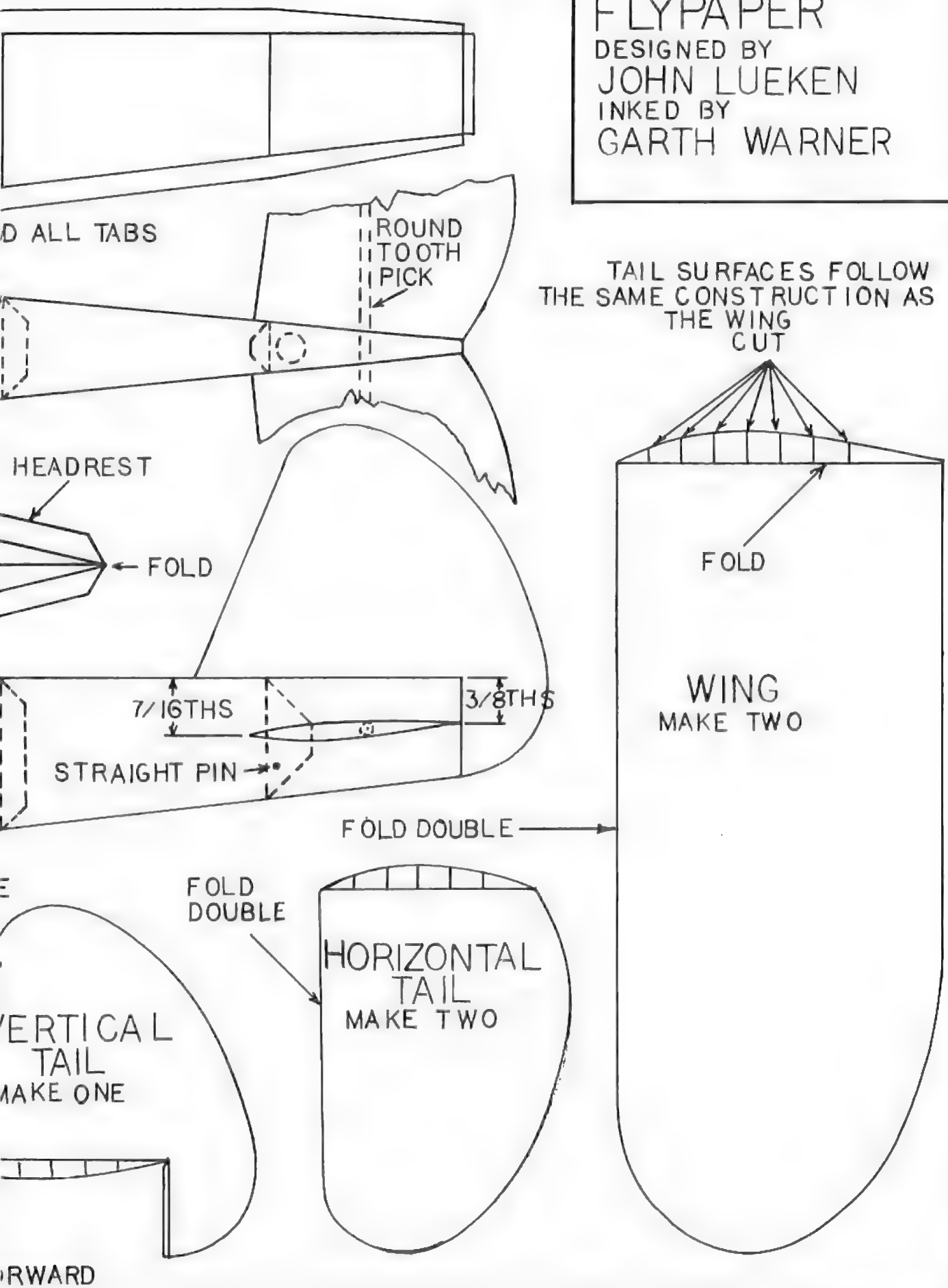
Fold the two halves of the fuselage together and overlap the nose formers, omitting the extra tabs as indicated in the plans. The downthrust and additional weight of a 3/4-in. metal washer with a 1/4-in. hole is necessary for good performance. Glue one to the inside of the nose former at this time. The remaining four formers are cut out, scored, folded, and glued into their proper stations.

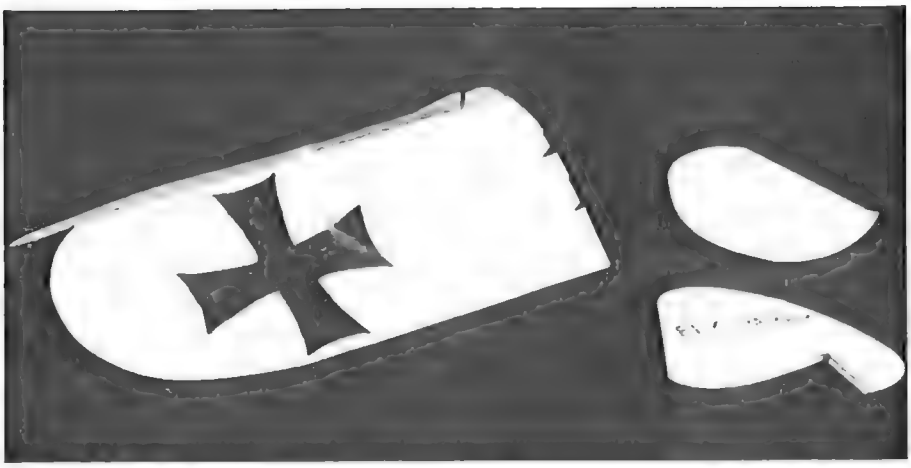
For proper alignment, it is advantageous to glue the top of the fuselage into place first remembering to cut out the cockpit hole if desired. The 1/32-in. wire landing gear is bent to the proper proportions and installed. Cut 1-in. wheels from cardboard and smear glue on both sides for strength. Believe it or not, Fly Paper will ROG! (Rise off ground.) Although the entire bottom section could be installed at one


FUSELAGE
SIDES
MAKE TWO
REMOVE TOP AND
BOTTOM TABS
FROM
ONE
SIDE
FOL
5"-6" PLASTIC
PROP.
SODA
STRAW
7/16THS
9/16 THS
NOSE DOUBLER
FOLD
FOLD DOUBL
FOLD SIDES BACK
FOLD
FOLD
1" DIA
FOLD
FOLD
FOLD TOP AND BOTTOM FO

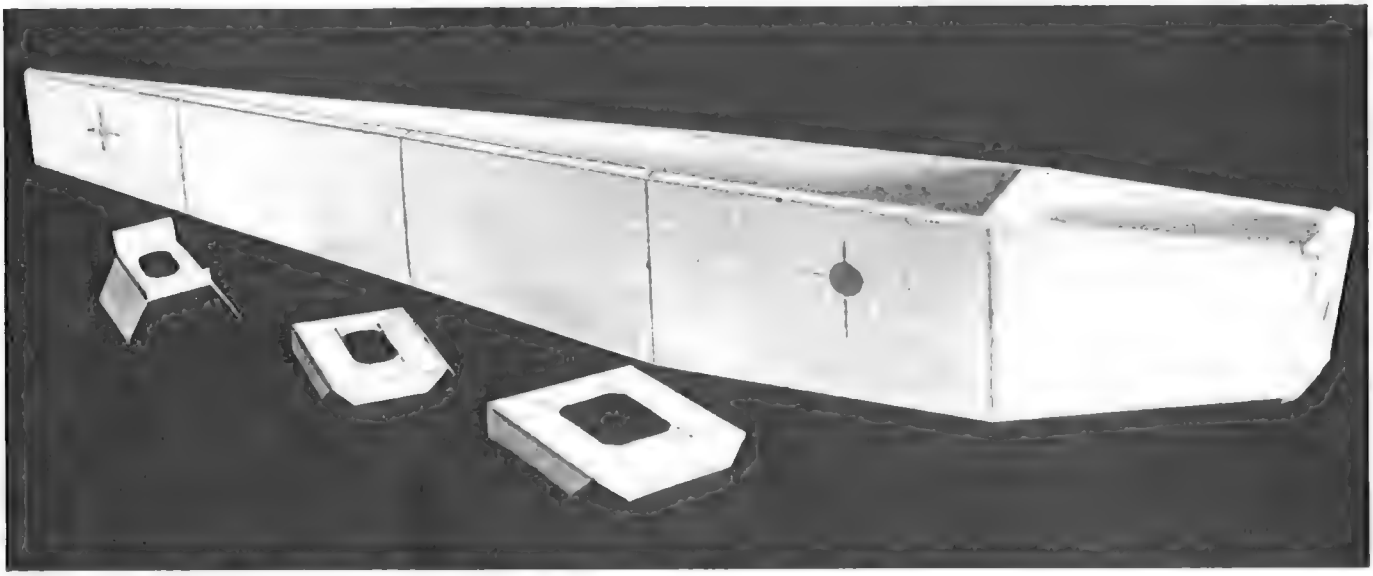
FLYPAPER

DESIGNED BY
JOHN LUEKEN
INKED BY
GARTH WARNER





Right: So what's to tell you? No spars, edges, or ribs—just cut out the paper making sure you fold it properly to have two surfaces for wing and tail assemblies. A rolled tube of paper—or a plastic soda straw or toothpick—makes a good spar for wing and stabilizer. Note holes for spars on fuselage side, below. Don't those formers look easy! Bottom: Just slide surfaces over spars and glue in place. Be sure the panels on one side line up exactly with those on the other side.



Left: Completed model looks as jaunty as some "standard" balsa and tissue jobs. Author's model came to roost on a roof, so it flies like wow. Headrest and windshield on plan—and why not a dummy pilot, even just a profile—make Fly Paper look like a genuine home-built or an early Red Baron crate. Below: Up and away! Those lines you see on wing and tail? This particular model was made from graph paper!

time, it has been found easier to divide it at the wheel base, gluing the aft section first and adding the forward at a later time.

Knowing that you have read the instructions and followed the plans carefully, the 1/4-in. holes for the wing spar, nose plug and rear motor accesses have already been cut out, along with an approximate 1/16-in. hole for the elevator spar. You are now ready to quickly assemble the rest of the plane.

As you cut out the wing, elevator, and rudder patterns be certain that you have folded the paper so that you have both a top and bottom surface. To join the two halves of the surfaces run a thin string of glue along the edge of one of the halves and press gently together. Score and fold the tabs in preparation for attachment to the fuselage. A rolled tube of paper may be used as the spar for the wing and elevator. However, a plastic soda straw and a wooden toothpick were used on all models so far constructed.

Although the nose doubler may be cut from the same paper it has been found advisable to use any lightweight cardboard that may be found around the house.

Be certain to follow the incidence locations of the wings and horizontal tail. These are critical to the plane's performance.

A head-rest and wind screen are indicated on the plans—which do nothing to increase Fly Paper's performance. However, any embellishments, including aircraft insignia, are always fun to include and make the plane your own.

This is one airplane for which it is not necessary to search for the mythical field of tall grass to test glide before the first flight. For the first flight hand wind approximately 50 turns of the prop, using two loops of 1/8-in. rubber. Launch straight and level with a fast toss. As with almost any rubber-powered aircraft, the performance and flight time will improve if a winder is used to pack in additional winds.

IT'S THE FINISH

Modern film coverings and epoxy paints—quick to work with, strong and beautiful to the eye—are a big step up for those with some experience.

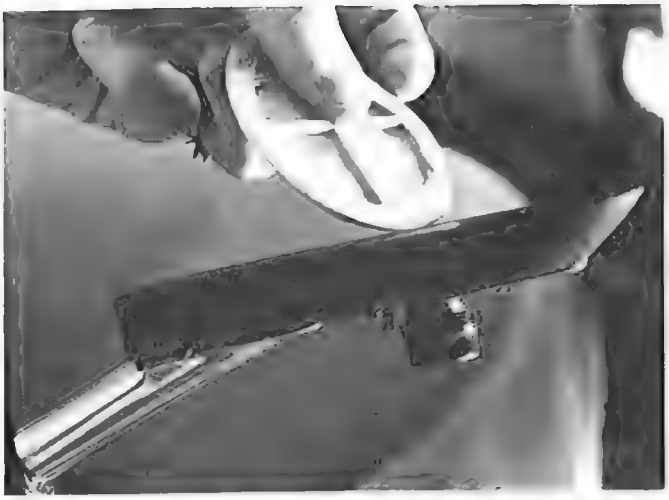
LARRY RENGER

After 75 years of model building, what's new? How about epoxy paint, epoxy glue, polyester resins, fiberglass, plastic films, spun coverings, aliphatic resin glues, contact cement, and silicon seal? New materials and techniques! A vital trend in modeling which started in the late fifties now finds total acceptance among the professionals and hobbyists. Modern chemistry has produced a wide variety of concoctions which the modeler, clever soul that he is, can turn to his devious purposes.

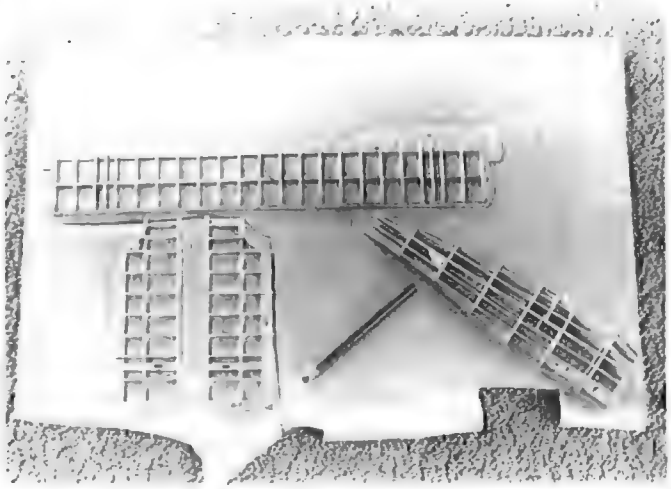
Most important of the new materials are film coverings and epoxy paints. High gloss, high strength plastic film with color and adhesive is available in two popular brands, Mono-Kote and Solarfilm. These films are easily applied and the wrinkles shrunk out with a household iron. The result is a superb finish which has good abrasion resistance and flexibility. Epoxy paints require mixing of two parts before use, but then may be brushed or sprayed on to produce an every-thing-proof finish which fills well, and is abrasion resistant too. When properly applied, especially with a spray gun, epoxy can give you a *concours* finish in about one-tenth the time required for a conventional finish with dope.

The subject being covered in the photographs is a Guillow Fokker Triplane which is being built for display. The tools needed are scissors, a grease pencil, sharp knife or razor blade, and a small iron. We use the Sealactor iron with a Robart's SuperShoe for convenience since my wife and I do a great deal of building. A small travel iron works nearly as well. These extra nice goodies are available from your hobby shop or one of the hobby mail order houses advertised in this magazine. MonoKote requires a setting between "silk" and

1 Opposite: Small scraps useful for small parts—and patches. Store them in box and you'll be amazed how much material is saved.



3 For a neat overlapped edge, trim the film to about thickness of part, then roll around edge with many gradual passes of iron.



2 Above: Careful cut-out of the film leaves little extra to get in the way while applying film. Keep those scissors sharp!

4 Careful layout of most parts of film minimizes waste. Leave border for handling, mark surface with grease pencil, label parts.

"wool" on a clothes iron (1/2 to 3/4 setting on the Sealactor), while Solarfilm works cooler at a "rayon" setting (about 1/4 setting on the Sealactor).

Surface preparation is important. Sand the areas where the film touches wood with 400 grit paper and then remove all dust and fuzz with a tac-rag. Tac-rags are available from most paint stores and auto supply stores, and some hobby shops. This is a slightly sticky rag which picks up and holds dust with only the gentlest wiping motion. Do not rub hard or you might rub some of the waxy material into your balsa. Solarfilm will go over dope or epoxy, MonoKote will not, so you may be able to apply a coat or two of dope to get the ribs really smooth. Every fuzz or dust speck shows as a bump in the covering.

Considerable film waste may be avoided by careful layout of the parts. Set the parts on the material and outline the cuts with a grease pencil. Leave about 3/4" border for handling and pulling. It helps to label each piece so you don't get too many left wings! Cut out parts only as you need them.

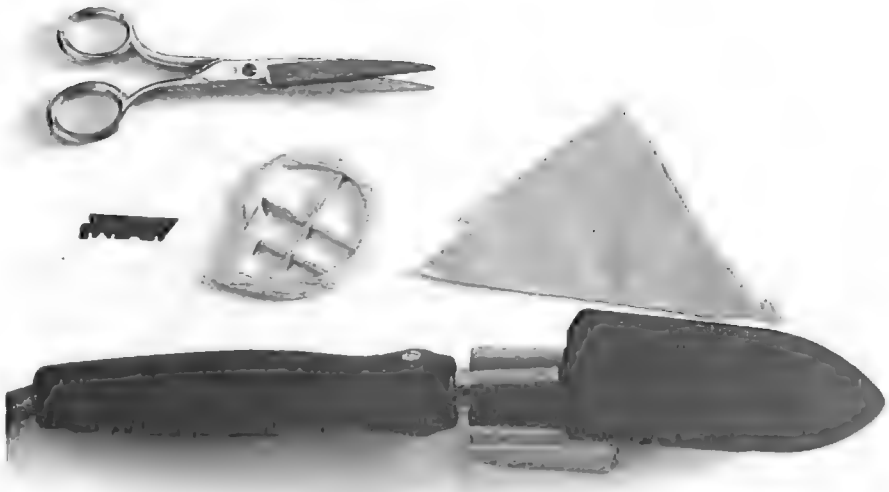
In order that the seams will be less visible, cover the lower surface first. Tack (that is, adhere) the covering down in one spot and tension it gently across the surface, then tack it at the opposite corner. Tack the remaining two corners down, and seal all around the edges; pull out wrinkles as you go. Cover both sides of each surface before you try to shrink out the wrinkles.

On curved surfaces such as wing tips, you can pull outward and heat simultaneously to stretch the film over the curve. Here, only practice will make a perfect job, though it is easier with Solarfilm than MonoKote. Please note, I am by no means knocking MonoKote, It is stronger, more stable, and has a better finish than Solarfilm. On the other hand, Solarfilm is cheaper, lighter, stretches more and will work at a low enough temperature that you may apply it directly over plastic foam. Both materials have their proper uses.

When covering is complete, you get to the fun part: shrinking out the wrinkles. One technique for shrinking the film is to slowly rub the iron (gently!) over the entire surface to be shrunk. Where the iron goes over wood you will have a patchy effect of alternate stuck and unstuck areas. You can pull these out by sticking masking tape down and then pulling it straight away from the surface fast. For ultimate strength of wood, though not as pretty a surface, follow the hot iron with an immediate rubdown with Kleenex to get a firm, even bond.

Although film coverings conform to compound curves, it is convenient to cover fuselages in several sections, since the seams are hardly visible. When the decor calls for large panels of some different color, you can cover parts in several pieces. In the case of the Fokker Triplane, the yellow wing tips and center panel were overlapped on white to make the panels for wing insignia.

A Great Lakes Special—from a Sterling Kit—was done in MoniKote and Trim MonoKote, though decals and spray enamel were required to finish the job on this display model. The model, by the way, was built by my wife, and only her second ever, too! For accurate positioning of trim films, dip the peeled trim in a thin solution of detergent so you may slide it about before it sticks down. The Great Lakes was assembled with white glue, and then final component assem-



5 Preparation for film covering: Sealactor iron set to correct temperature, part sanded, dusted; film, razor blade, and scissors convenient to the hand.

6 After both sides are covered, shrink film free of wrinkles by heating whole surface with iron. Note temperature set at 75% of range.

7 MonoKote trim applied accurately by dipping first in mild detergent solution, then sliding it into exact position on model.

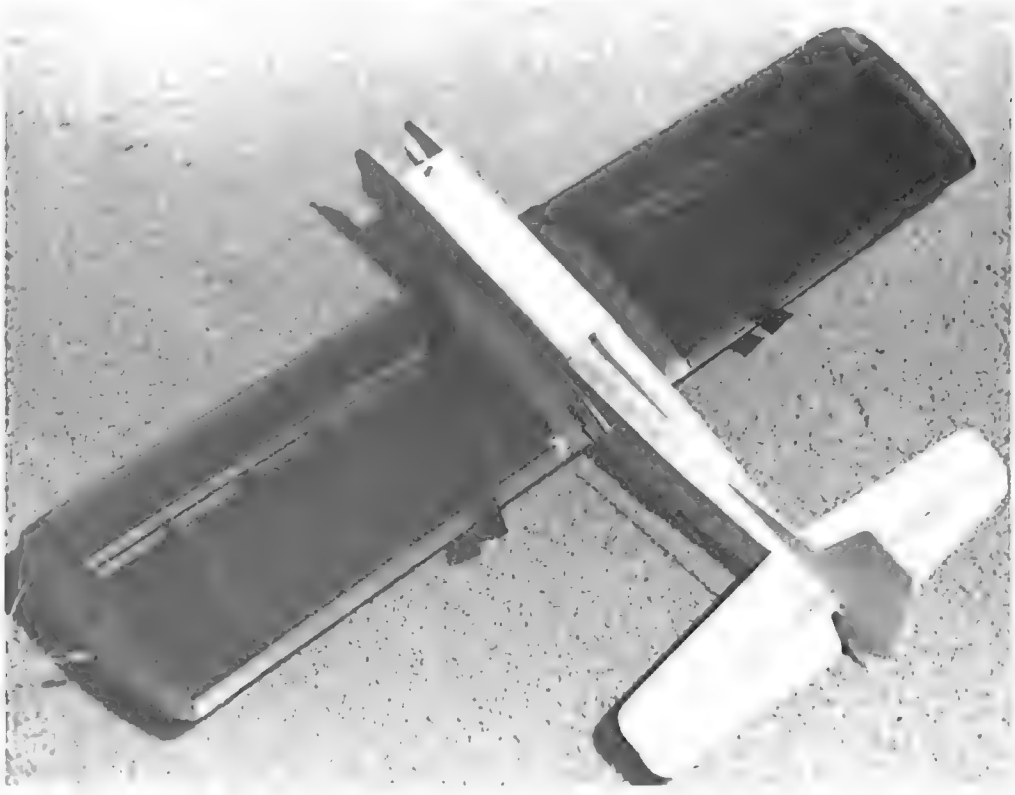
8 To apply decals to film, first clean film surface with thinner or alcohol, then follow standard decal directions.

bly and bracing with 5-minute epoxy. Way down underneath it all is good old balsa wood.

Moving on to a power model, let's look at the finish for a Dumas' "Scout" kit. My standard finish now is finishing resin on the wood parts, film over the wings, and then epoxy paint followed by trim film and decals for decor. Here is the technique for applying the finish from raw balsa up. First, of course, is the surface preparation. Sand the structure smooth with 220 grit sandpaper. Fill all nicks with Pactra Plastic Balsa, then finish sand the structure with 320 or 400 grit paper. Use the tac-rag to remove all dust.

The newest material for filling balsa grain is called surfacing resin. Three brands are now available: Francis Products, Hobbypoxy, and K&B. The material paints on as easily as clear dope, settles out to fair smoothness, then sets up completely in half an hour. The surface dry sands neatly into a white powder. Two coats completely fill and seal balsa. The resin will not set up over butyrate dope, some epoxy, and contact cement areas. Any spots that fail to set may be forced by mild heating for a couple of hours. Make up about 1/2 ounce of resin by carefully following the in-

1 Epoxy glue is useful in closed area applications, such as doublers for the nose of this Dumas Scout. It dries quicker, will not warp sheet like White Glue. Contact cement is quick too, but not as strong.



2 Fuselage, tail, have been resin surfaced, wings covered with Solarfilm, vinyl tape for masking applied.

structions on the can. Mix the resin and hardener well and then brush it on. Clean your brush in Hobbypoxy thinner or similar material. After half an hour or so, sand down the high spots and any fuzz. Mix up a new batch of resin, and brush on as smooth a coat as you can. If there are any small pits visible, put an extra drop of resin on them to fill in.

At this time you can sand the model to a perfectly flawless finish. With any care at all, you will not cut all the way through to raw balsa. A final touch up with resin will cure any mistakes. Vacuum or blow the dust from your model and follow with a thorough clean up of your work area. Finally, tac-rag the model to remove every last trace of dust. The better a finish, the more any flaws show up.

After the surfacing step, I cover the appropriate areas with my choice of film for the particular model. In the case of the Scout, transparent blue Solarfilm was chosen, as weight was the prime consideration here a one mile altitude in Colorado. For the intended color scheme, only the wings needed covering, so this was accomplished rapidly. Vinyl electrical tape was used to mask off the paint areas, as it provides a better seal than standard masking tape, and has a

3 The completed Scout with trim tape, film, and epoxy paint. Better finished models last longer. These wings are see-through!

1 One of the new surfacing resins for filling balsa. Hardener is added a few drops to the ounce. Follow directions exactly.

smoother edge. At this time mix up about one ounce of epoxy paint (I used Hobbypoxy, but K&B is also available if you are using spray equipment); about four plastic spoonful each of parts A and B will do it. Be sure to get the proportions exactly half and half. The epoxy must set at least 45 minutes, then filter it through Silkspan to remove those last little crudlies which seem inevitable.

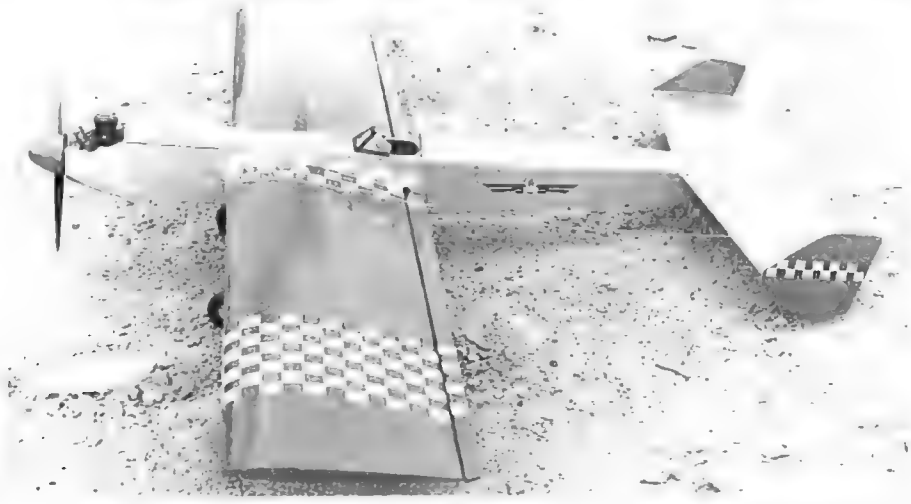
Just for good luck, tac-rag the model one more time, and you are ready to paint. Start at the rear, paint each side of the tail surfaces in turn, then start working your way around the fuselage until you get to the nose. Put the model away for 24 hours in a dust-free place, and store the unused paint in a sealed jar in your refrigerator. Next day, use 400 grit wet-or-dry paper and a thin detergent solution to gently wet sand the painted areas. Sand just enough to knock off any lumps that sneaked in and even out any runs or brush overlaps. Rinse off the sludge, dry and tac-rag the model, then paint on your final coat (let the paint warm up to room temperature first). After the paint has set for half an hour, carefully peel off the masking tape. Always pull the tape back over itself to remove it; if you pull straight out you can pull paint or film up with it! Put the model away for another 24 hours, then add any trim, decals, or tape decor you desire.

Finishing is easier with modern conveniences such as a top quality spray gun and spraybooth. The two-channel RC model in the photos had red Solarfilm directly over the foam wings, and a resin/epoxy finish as outlined above, except that the silver Hobbypoxy was sprayed on. Spray painting results in a much more even application of paint than I, at least, have ever learned to apply by brush. More even application means less paint on the model and less weight. A spraybooth is very useful, as it has a fan and filters to keep overspray from covering you, the surroundings, and especially your lungs. If you spray, but do not have a booth (the local auto body shop might let you use theirs) be sure to get a spray mask from your local paint store.

In conclusion, the modern techniques of finishing are well worth learning, since an outstanding paint job can be applied in three days that would have taken a strenuous month for a classic doped finish of the same quality. As an added benefit, the modern materials are more durable and stable (not that my models die of old age). The initial cost is higher, but the total cost per job is the same or lower than the old way. Once you have learned to use the new finishing goodies, you may never want to change. ●

2 Wet sanding of the first coat of epoxy paint. Use wet or dry carborundum paper and thin detergent solution. Wash off the model before applying paint.

3 Careful application of epoxy paint results in finest of finishes. Top-of-the-line Badger spraybrush and a real spray booth are the ultimate in modeling luxury.



4 Solarfilm, resin, epoxy, trim MonoKote and decals combine to make a model look its best. The Slikker is a two-channel RC model with a Half-A engine. Checkerboard is nifty.

THOSE MAGNIFICENT WOLFPACK THUNDERBOLTS

BEN MILLSPAUGH

Although the article specifically deals with the detailing of Revell's two versions of the P-47, the author would like to give the readers a small bit of his enthusiasm for the airplane that he considers one of the greatest birds of all time.

In the course of writing a book about the P-47 I became so intrigued with the 56th Fighter Group and the markings of their aircraft.

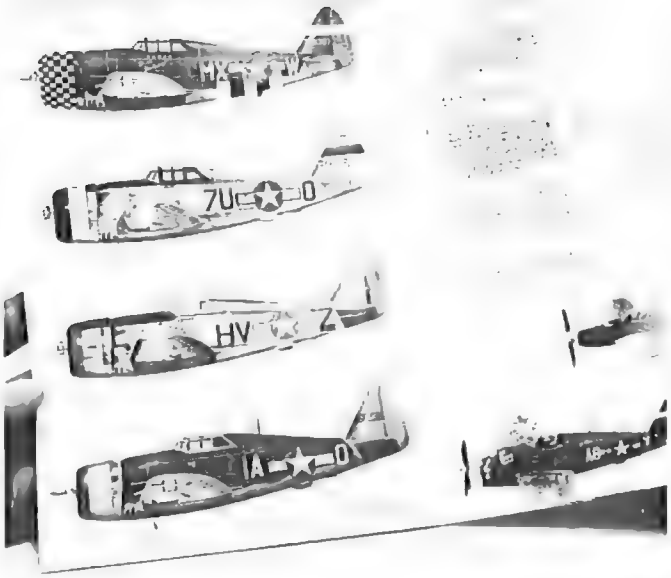
The 56th F.G. was number two in total "kills" in the ETO. The 4th F.G., a T-Bolt and later Mustang outfit, came out on top with a 1016 aircraft destroyed. Although the 4th was on top with 1016, the 56th had 1006 with a loss of only 128 P-47s. The 56th had a kill rate of 8 to 1, whereas the 4th had a rate of 4 to 1. The most impressive thing about the Thunderbolt was its ability to take punishment and still bring its pilot home.

The P-47 was made by Republic Aircraft. It had a four-blade prop powered by the Pratt & Whitney R-2800 engine, and was capable of speeds well in excess of 430 mph. Fire-power was a great asset. The P-47's eight 50-caliber machine guns could saw an enemy plane in half if continuously fired at less than 500 yards!

Books have been written about the Thunderbolt but not enough has been written about how to accurately build a good model of the plane. The all-silver razorback version featured is the easier of the two. Several model shops now carry a line of adhesive-backed aluminum that can be used on these big 1/32nd-scale models. One is called "Metalskin;" this has a paper bond between the aluminum and the adhesive. Another and, in my opinion, slightly more desirable version is "Bare-Metal." Bare-Metal has no backing—the adhesive is applied directly to the aluminum. This comes out to look a bit more realistic since it is thinner and can be applied more effectively around curves and corners.

Alan Breeze's Company recently released a version called "Scale-Metal;" the flat or dull aluminum sheets are nice in contrast with the almost chrome appearance of the Bare-Metal.

Above: The finished "Silver Lady"—the razorback version of the P-47—has been skinned with foil. Only painting is the red nose and rudder and the Silver Lady writing on the side. The crown can be made from decal stock or painted. Special lettering is made from Micro Scale's "Color Trim Film" decal stock. Left: Bubble-canopy version of the P-47 as flown by top ace, Gabby Gabreski. A high-quality air brush is necessary to achieve the thin-line painting on this aircraft. The large scale of this Revell model will allow the hobbyist to get it perfect if he takes his time.



Top: Reference for the Silver Lady was the Kookaburra Technical Publications "P-47 Thunderbolt" by Geoff Duval. Supply and source information is given at the end of the article. Above: Micro Scale, a product found in the decal section of many hobby shops, produces clear or colored decal sheet—from which you can make your own markings.

To make the model more realistic, I would suggest separate panels using a mixture of both the flat and shiny versions. To prepare the surface of the razorback version, first take the basically assembled fuselage, wings, and components (separately assembled but not cemented into a unit aircraft) and give them a thorough scrubbing with a Brillo or S.O.S. pad. This will take away some of the excessive rivet detail and will also remove the mold release agent. The mold release agent, if not removed, will keep the aluminum from sticking properly.

After you've cleaned and dried the model thoroughly, start applying small panel-sized squares. The fuselage is finished as a unit then the wings, and, etc. Don't forget the landing gear doors and other accessories. The aluminum does not take kindly to having masking tape applied to it and then removed. Therefore, I would suggest that areas to be masked be covered with a tape that is not very wide, such as 1/4" masking, and that the tape first be applied to a window or table to lose some of its stickiness. Be careful when removing it from the aluminum—you should have no other problem.

Areas of the aluminum can also be "weathered" by using either dull paint coats (clear) or shiny areas with No. 000 steel wool. The aluminum should be burnished with a soft rag and waxed with a high quality automotive wax such as Blue Coral sealer. The special decals, such as the lettering HV-Z, were made from Micro-Scale's "Color Trim Film" decal sheet stock. The letters were carefully cut to the right scale with an X-acto knife No. 11 blade.

The crown on the side of the cowl was hand-painted along with the "Silver Lady" on the fuselage just below and forward of the cockpit. The American decal came from the 1/32nd Revell P-47 bubble cockpit version. This was not included in the razorback version and a separate kit had to be purchased. Reference for the "Silver Lady" was the Kookaburra Technical Publications booklet, "Republic P-47 Thunderbolt" by Geoff Duval.

The bubble canopy version featured is the famous "Jug" of top-ace, Gabby Gabreski. For this well-known aircraft, it is surprisingly difficult to get all the camouflage correct. However, if the modeler will study the model's final photograph, you will find a very accurate reproduction of the actual aircraft. The photograph of Gabreski climbing from his famous "D" version will reveal the very haphazard camouflage scheme.

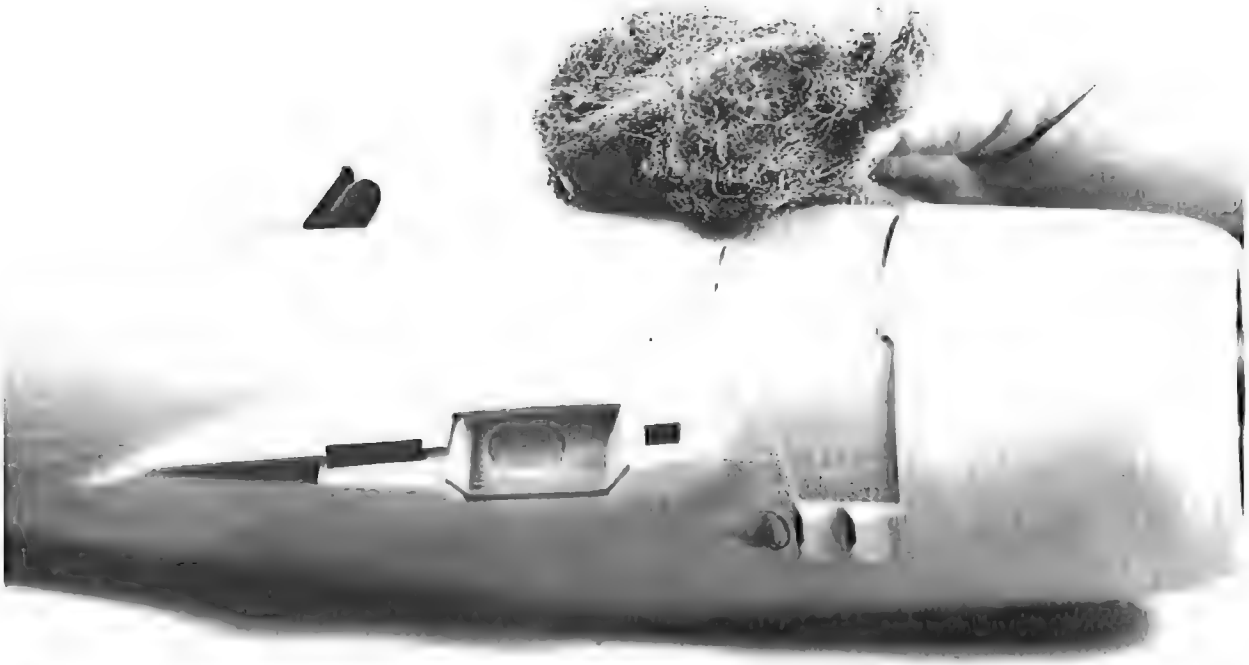
A high quality airbrush is needed to achieve the thin-line painting on the aircraft. After careful examination of existing photographs, it was found that the invasion stripes on the fuselage were white with a thin band of black in outline. The star/bar in roundel was darker than the normal insignia blue, giving an almost blackish-blue appearance. A small "sight" also appears about two feet ahead of the cockpit windscreen. I suspect that this is an old-fashioned barrell sight for "duck hunting." Page 19 of the "Markings of the Aces" by Theodore R. Bennett will reveal many details of the Gabreski aircraft including the correct width of the invasion stripes, on the underside of the wing, and the correct size of the underwing insignia.

As far as I can tell, the aircraft that served in England were sometimes camouflaged with British paint mixed with American standard colors. Research taken from the Authentical Decal sheet No. 4 reveals the dark green portion of the Gabreski plane to have been Medium Green No. 42. The gray-blue portion was Ocean Gray with Neutral Gray No. 43 on the underside. The ocean gray is a British color. The final painting will depend entirely upon your skill. However, the large scale of the Revell model will allow the modeler to get it almost perfect if he takes his time.

This brace of Thunderbolts will add a touch of excellence to your collection. The time and effort that goes into the careful research will pay off when you finish these models either with the airbrush or a metal skin. Either way, it is fitting to do a fine job on such a noble aircraft.

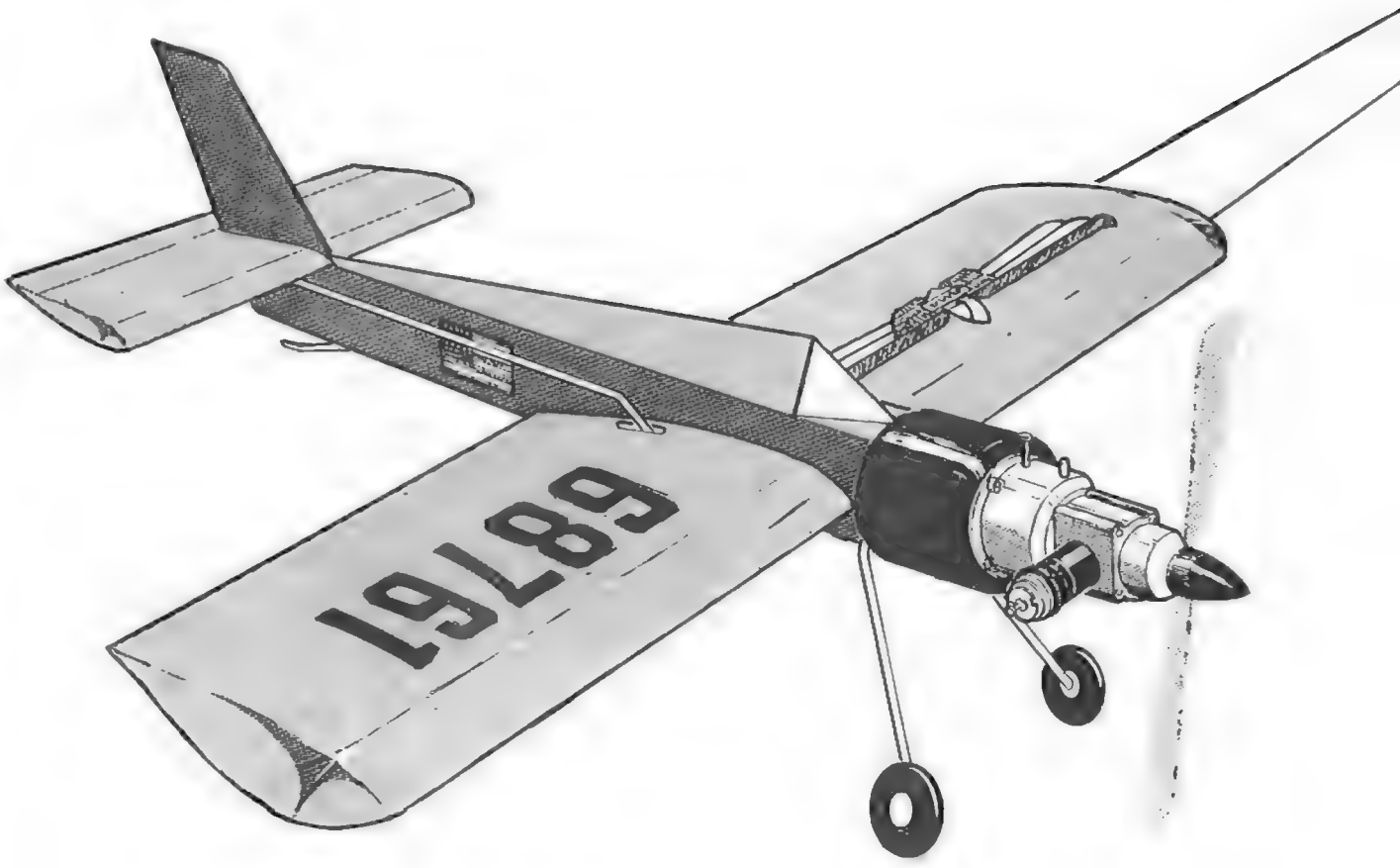
If you have trouble getting the above-mentioned supplies at your local hobby shop, write for a catalog at this address: The Squadron Shop, Inc.; 23500 John R; Hazel Park, Mich. 48030.

Every finish product mentioned in the article is handled by this company and their catalog is very complete. They also produce a quarterly called, "The Squadron," which gives many hints and tips to better modeling.



Top: The model that is to be skinned (Razorback) is first assembled according to instructions, and then sanded with steel wool. Above: A soft rag, such as an old T-shirt, is used to burnish the aluminum. Note rivet details. Left: A product such as "Bare Metal" is cut into small pieces and applied to clean, oil-free surface. Trimming done with sharp No. 11 X-acto knife.

THE



SHOW OFF

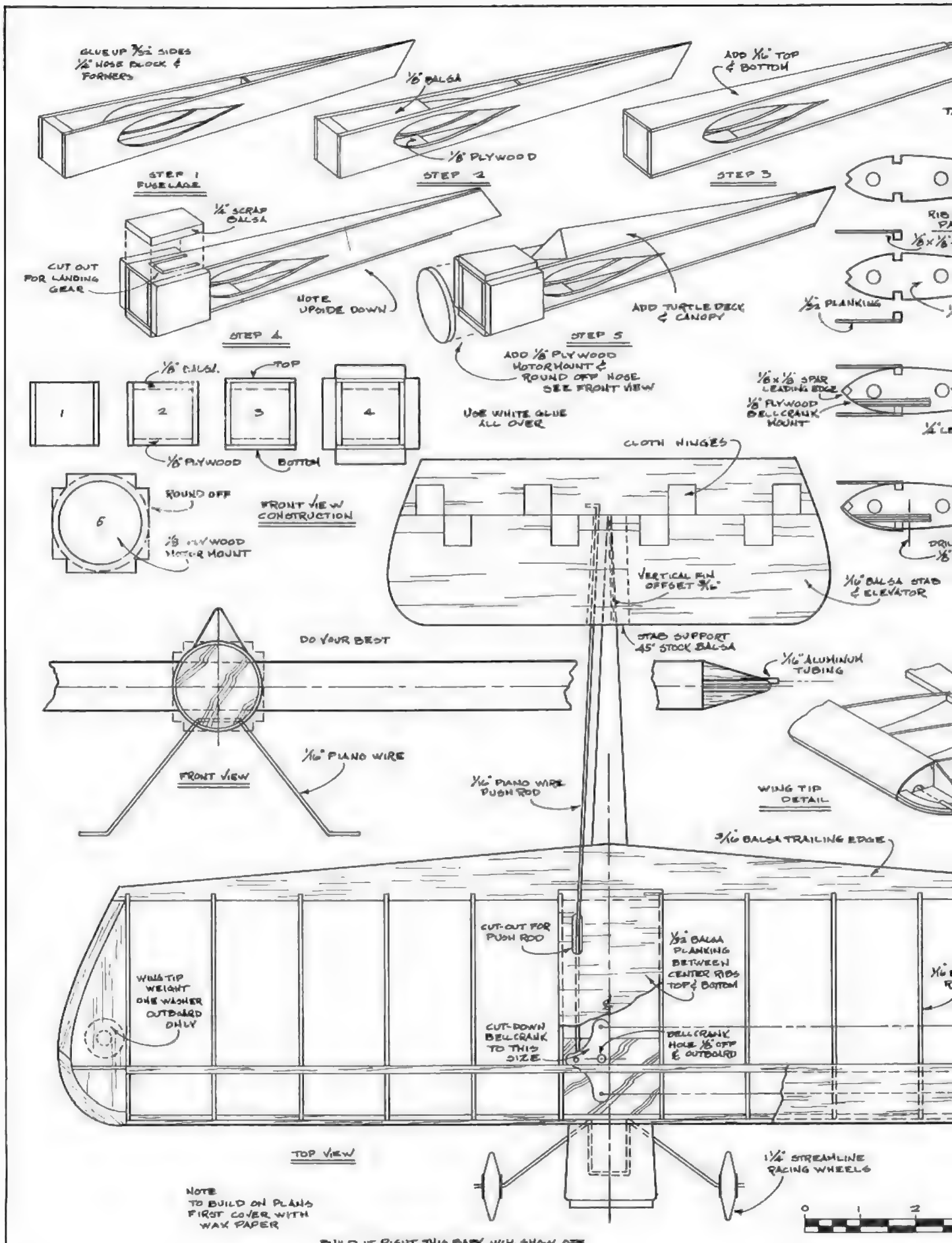
IF YOU CAN FLY CONTROL LINE, YOU WILL WANT TO STUNT. HERE'S A GOOD 049 TRAINER.

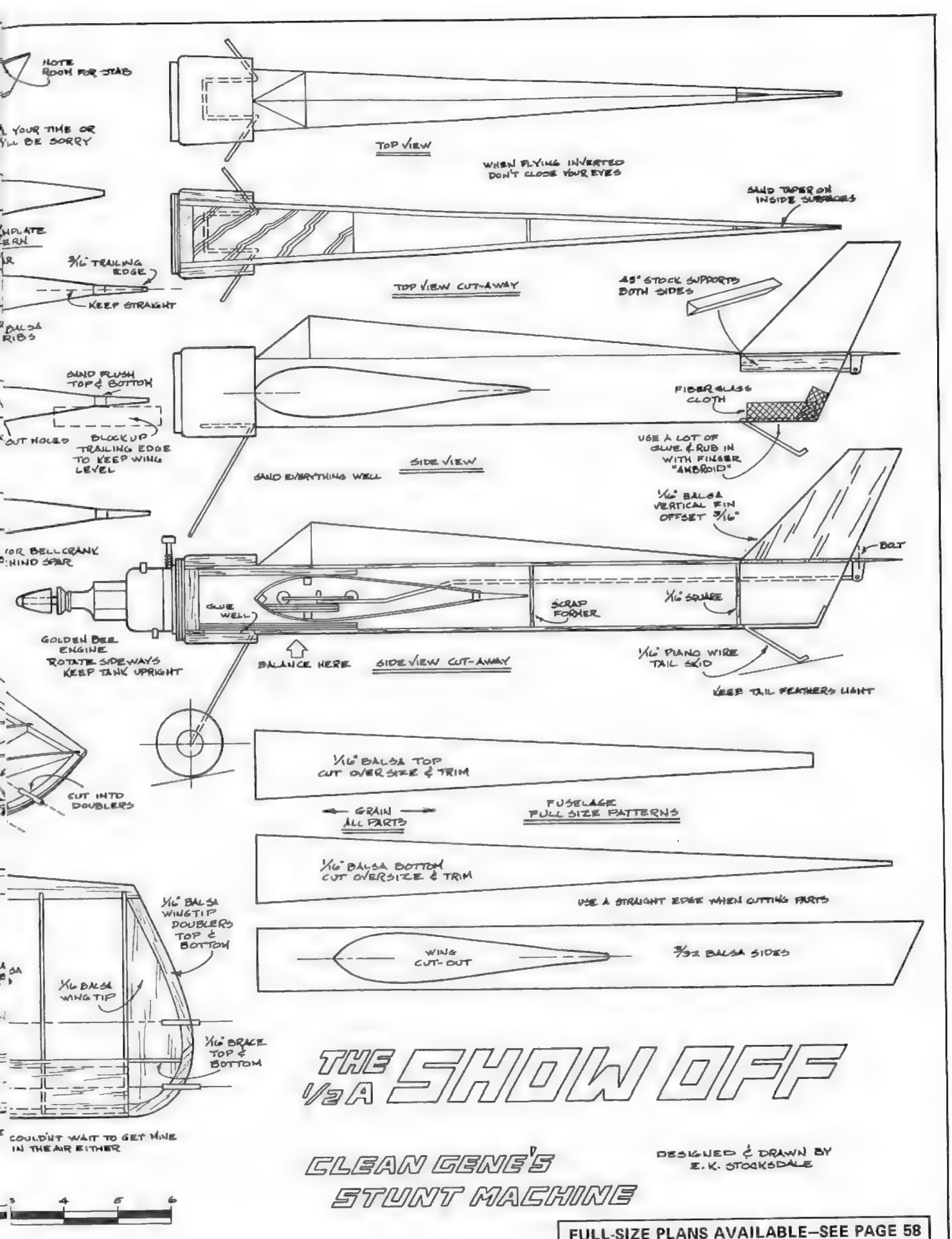
E.K. STOCKSDALE

My intention with this design was to come up with a good ½A stunter which was easy to build and fly. A plane with a flat-bottom wing will not do anything but fly level and maybe loop, which means you will not be able to use it for a stunt trainer. This design was built around a symmetrical wing cross section (airfoil). This means that the top of the wing rib has the same shape as the bottom. Because of this wing cross section the plane will perform any stunt in the book. With this stunt capability in mind, if I could get the plane to do a wing-over with good line tension (pull on the control lines), the rest would be easy.

Also, I decided to build the plane around a Cox Golden Bee engine so readers could find the means to build it. The Baby Bee and the Golden Bee are the same except for the fuel tank setup. These engines have a lot of power of their size, so don't sell them short.

The end result was put to the test one weekend during a 15-mph crosswind. A perfect day to put it through the wringer. The plane did its best with a 5¼ x 4 prop, and Cox Red Can fuel. After cranking it up, it took off like a shot (a lot faster than I had hoped) with plenty of line tension. I use 35-foot lines on all my ½A planes, and the 15-mph wind did nothing to this one at all. I went into the first wing-over with shaking knees—it went over the top as well as any big plane I ever flew. It also had the smoothness of a big stunt plane going through the loops. Figure-eights are a snap as well as outside loops and inverted laps. I found no problem with any maneuver except for the four-leaf-clover, and this was only because I can't do that one myself. You will find this plane well worth your while.


GLUE UP 3/32 SIDES
1/2" NOSE BLOCK & FORMERS
1/16 BALSA
1/8" PLYWOOD
ADD 1/16" TOP & BOTTOM
STEP 1 FUSELAGE
STEP 2
STEP 3
1/2" SCRAP BALSA
CUT OUT FOR LANDING GEAR
NOTE UPSIDE DOWN
ADD TURTLE DECK & CANOPY
1/32 PLANKING
STEP 4
STEP 5
ADD 1/8" PLYWOOD MOTOR MOUNT & ROUND OFF NOSE SEE FRONT VIEW
1/8" BALSA
TOP
1/8" PLYWOOD
BOTTOM
USE WHITE GLUE ALL OVER
1/16 x 1/8 SPAR LEADING EDGE
1/8" PLYWOOD BELLCRANK MOUNT
CLOTH HINGES
ROUND OFF
FRONT VIEW CONSTRUCTION
1/8" PLYWOOD MOTOR MOUNT
VERTICAL FIN OFFSET 3/16"
1/16" BALSA STAB & ELEVATOR
DO YOUR BEST
STAB SUPPORT 45° STOCK BALSA
1/16" ALUMINUM TUBING
1/16" PIANO WIRE
FRONT VIEW
1/16" PIANO WIRE PUSH ROD
WING TIP DETAIL
3/16 BALSA TRAILING EDGE
CUT-OUT FOR PUSH ROD
1/32 BALSA PLANKING BETWEEN CENTER RIBS TOP & BOTTOM
WING TIP WEIGHT ONE WASHER OUTBOARD ONLY
CUT-DOWN BELLCRANK TO THIS SIZE
BELLCRANK HOLE 1/8" OFF & OUTBOARD
TOP VIEW
1 1/4" STREAMLINE RACING WHEELS
NOTE TO BUILD ON PLANS FIRST COVER WITH WAX PAPER
0 1 2
BUILD IT RIGHT, THIS BABY WILL SHOW OFF



THE 1/2A SHOW OFF

CLEAN GENE'S STUNT MACHINE

DESIGNED & DRAWN BY
E. K. STOCKSDALE

FULL-SIZE PLANS AVAILABLE—SEE PAGE 58

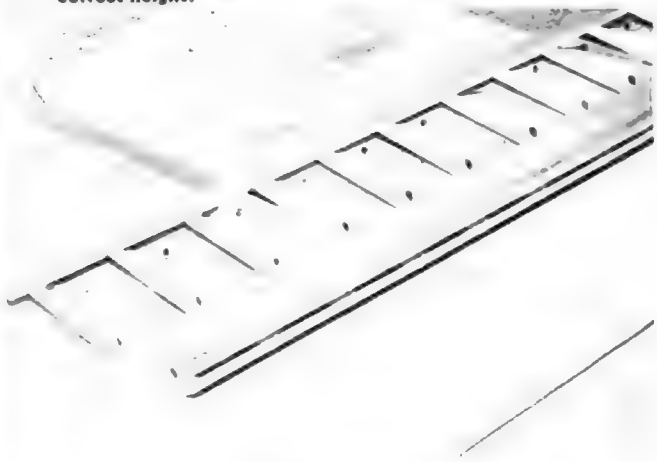
1 Nose is built up from sheet balsa, right; then ply mount glued to nose, left, which is then rounded off. Gear wires left straight.

2 Three steps in making ribs: Blanks slide over bolts, with templates on each side (center). After sanding, remove bolts. Ribs on right.

3 Leading edge sheeting glued to spar, left. Sheeting bent down and glued, right, held to leading edge by spring-loaded clothespins.

5 At top of picture, the second piece of leading edge sheeting bent down and glued in place—held by masking tape. Note bellcrank, etc.

4 When sheeting has been glued to spars, top and bottom, wing is laid on plan. Pieces of wood used to hold trailing edge at correct height.



Construction

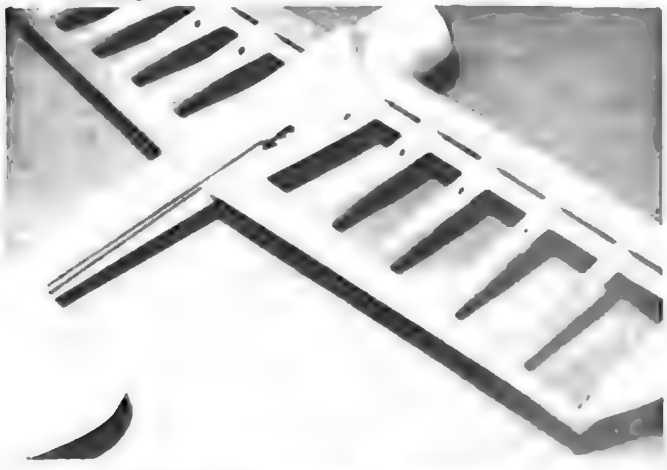
Fuselage and landing gear: This is a simple box type fuselage. Being built-up, instead of a profile, makes it very good looking, also very strong and light. Cut out the sides from 3/32" sheet balsa using the full-size layout on the plans. Cut out holes for inserting the wing. The ¼"-thick nose block is cut from hard balsa, because this will receive the screws when mounting the engine. Run the grain up and down. This makes it easier to taper the sides of the block. The tail-end of the sides should also be tapered (on the inside), so when they are put together the very end of the fuselage will be 1/16" thick. These parts are glued together as shown in the photos. I use white glue wherever possible because it gives a strong bond. While this assembly is drying, cut out the fuselage top and bottom parts from 1/16" sheet balsa. Cut these parts a little oversize; they can be trimmed off to fit after they are glued in place—but don't glue them on yet.

Most building instructions say to trace all parts off the plans, but this doesn't always work. Sometimes the plane doesn't come out exactly as shown on the plans. But even though it is sometimes difficult we keep trying to make things fit properly. So when making the 1/8" plywood part for the landing gear base, lay the fuselage assembly (when dry) over the plywood and trace the actual size onto the plywood itself. You will be sure it fits. Do the same with the 1/8" balsa piece for the topside stiffener. Glue these parts in, keeping them flush so the fuselage top and bottom will fit well. The formers or bulkheads behind the wing opening and in the tail section will add a lot to the overall strength of the fuselage. These also should be put in at this time. When these parts are dry, install the top and bottom.

6 The completed wing slides into place through the opening previously cut in the two fuselage sides. Model is ready for covering.

7 Counterclockwise, steps in making horizontal tail, in attaching over-and-under hinges. Slide finished tail to right position, glue.

8 Cockpit superstructure is added touch for realism. Note how pushrod is bent and exits through slot in center section sheeting.



9 Finished airframe. Leadouts pass through pieces of tubing glued to wing tip. Leadouts should be flexible (stranded) wire type.

The front end of the fuselage is easier than it looks. First, bend the landing gear from 1/16" music wire. Try to get the shape as close as possible to that shown on the plans. If the landing leg ends are left straight, they later can be bent and cut to size. Trace the shape (which you bent) on the bottom of the fuselage and cut away the balsa. The wire must rest against the plywood inside. Glue well and add the ¼" balsa blocks which form the round nose. The 1/8" plywood motor mount disc can also be glued on at this time. When dry, trim and sand to a round shape using the disc on the nose as a guide. The tail skid, after being bent to shape, is glued in place with a layer of cloth over it. Rub in plenty of glue with the fingers. Don't try to make the final bends in the landing gear until the assembly has set overnight.

The cockpit superstructure may give some of you a fit, but this is where you will learn to be a better modeler. The strength of the fuselage is there in the box, so whatever you do on the top is purely for looks. If you find your joints are not tight, use some filler or cover the areas with tissue. This will make them look much better.

Wing: Start by cutting out the ribs. The best way to get them all the same is to sandwich them between templates when sanding their outlines. I made my templates from 1/16" plywood. This takes a little more time, but it is gained back when making the ribs. When you find how well this plane flies, you will want to build another one or more. I have been building them six at a time. With the templates, I turn out a set of ribs in about ten minutes, every one being perfect. You must make two templates, and care must be taken to make them perfect, because you will use them over and over.

(Continued on page 52)

10 Side-mounted engine, rakish landing gear, snappy (but not heavy) paint job, and your AMA decals, all contribute to good looks.

new products

Top Flite P-51B Mustang: Small .049-powered control-line models are the favorites of my two sons. They are easy to fly, easy to build, and can be flown in the neighborhood without too much planning or fuss. If something goes wrong, these light models bounce quite well without too much damage.

For some time either my 9- or my 8-year-old son has been building the ½A control-line models for the New Products section of JAM. They built these models without any physical help from me. But at times I have had to do some explaining of instructions. However, up until this review all of the ½A models had a solid balsa wing. The Top Flite P-51 Mustang has a regular built-up wing, using ribs with a spar and a leading and trailing edge. My 8-year-old beat me to the box when it came in the mail and said that he was going to build the Mustang. After looking at the plans I saw that they were very clear and understandable. So I told him to call me if he needed help.

The first call for help came *after* the wing was nearly complete. He needed me to hold the bellcrank mount so he could drill the holes for the bellcrank and the landing gear. The wing was built perfectly. Building the rest of the model is pretty much an assembly job and is not difficult. In finishing the Mustang we decided to use MonoKote. This will let you complete the wings in minutes. The body is more difficult to do, and we recommend that you use regular dope to finish the body.

As with every Top Flite control-line airplane that I have ever built and flown, this model performed excellently. Performance is better and seems more controlled than similar-sized models using a solid balsa wing. The turns can be made sharper and the plane seems more stable. The glide after the engine stop is longer too.

If you want to build a sharp model that is one step up from the all-balsa profile jobs, this Top Flite model is a good choice. If your hobby shop does not have the Mustang, then give Top Flite a try at 2635 S. Wabash Ave., Chicago, Ill. 60616.

Jasco Flash X-12: Learning to fly free flight can be a very disappointing experience unless taken one step at a time. The recommended way to make the move into free flight a most pleasant experience is to start simple and only move to more difficult subjects once the basics are mastered. Jasco has a line of four models designed for the beginner's level in free flight. Two of the models are of the hi-start type. These are basically gliders that are launched using the power of a stretched rubber band added to the towline to catapult them into the sky. The other two models are rubber-powered propeller driven.

For this test I built and flew the Flash X-12, a 12" span rubber-powered all balsa model. I also carefully examined the other three kits in this line. Anyone old enough to read and understand instructions of the most simple kind can build and fly this kit with a minimum of help. The design is excellent, the materials of fairly good quality, and the finished model flies better than many others. At $1.29 the price is right too.

All of the wood parts are either cleanly die cut or preshaped. You need only to glue seven joints, and then assemble the model. The motto of Jasco is "Build tonight—Fly tomorrow." Accurate in this case. Aside from the glueing and the assembly there is nothing else to do. No doping or papering is required or recommended. The balsa is precolored to provide an attractive design on the model.

The entire side of the plan that does not have building instructions does have instructions to make easy your adjusting of flight. Just about everything that could possibly go wrong is covered. So this is a good model to start learning about free flight—it almost guarantees success. Order from your hobby shop or directly from Junior Aero Space Co., Box 135, Northridge, Calif. 91324.

PAUL KUGLER

Dremel Electric Engraver: One of the tools that I recently ran across is not technically an item built especially for the modeler. It is one though, that will have great value both to the modeler and to his family. The tool is the Dremel electric engraver, and it is manufactured by the people who produce the Moto-tool and the Moto-shop.

What is the value of a tool that does not help me build a model? Well, the advantage that I have found is a very large one. Using this tool the modeler can permanently engrave almost any material. I have not found a metal that is used in modeling, or for that matter in the home, that cannot be permanently marked using the Dremel engraver. Modelers will find that they will be putting their name or social security number on their most valuable modeling possessions. I have engraved my name and social security number both on each radio control set that I own. I have also done the same for each of my engines, and all of my model railroad equipment. Every tool has been positively identified so there will be no doubt in the future about who the owner might be of that piece of equipment that was "found" lying around.

Free flighters will appreciate the opportunity to mark expensive engines, and hard to replace timers. Radio control buffs who are as much collectors of equipment as they are users, will want to mark their starters, fuel pumps, field boxes, and all the other equipment as well as the radio gear.

Our community used this tool to start a program called Operation Identification in conjunction with the Police Department. We are trying to get everyone in the community to mark each item in their house that can be removed and stolen. In this way we hope to discourage crime. Say, this may be a good way for you to get a free tool. Encourage your parents to buy the tool to safeguard their home, and then use it to protect your modeling equipment.

Details are available from the Dremel Mfg. Co., Racine, Wisc.

The Nomad: The easiest way to fly radio-control airplanes is to have only one control, that proportional. Among the types of airplanes available for this type of single-channel flying, the easiest to learn to fly on, and the most rewarding in terms of long flight, is a glider. The Nomad is such a plane.

The basic design is well proven. Nomad has now been updated and made easier to construct for the beginner. The fuselage has been made stronger to withstand the bumps that the novice flier is sure to provide. Construction is of balsa with matched one-piece fuselage sides, and although the wings use ribs, the entire construction is simple enough for the beginner who has built several model planes.

I did not build this model, rather Dave Boynton of *Model Dealer* magazine did. Dave is not an expert, but the Nomad went together easy enough. He estimates that the ship took about 20-25 hours to build and cover with MonoKote. Full-size plans are included, and another nice feature for the novice is that the kit includes a separate sheet of construction photographs that illustrate the steps of construction. The kit is complete too. Only the covering material is not included. The parts fit well, and need little trimming to make them fit.

The Nomad is a powered glider. It takes either an .020 or an .010 engine which should get the model up to about 400 feet altitude. If you have thermals or slope lift this altitude should get you long flights.

We used the ACE RC Stomper unit with excellent results. The model flew right off the building board with no trimming needed. Dave recommends that you first test glide the Nomad by hand, then when these flights are satisfactory you should try a short engine run. If everything is OK, then fill the tank and expect a very stable, gentle, slow, and responsive flight.

Nomad is available from your hobby shop or directly from the House of Balsa, 2814 East 56 Way, Long Beach, Calif. 90805 for $11.95.

LETTERS

(Continued from page 6)

And The Winner Is. . .

Enclosed is a photo of my ninth grade shop class, taken during an A.M.A. Cub Contest. Mr. Russ Barrera helped provide the planes, awards, etc.

John Lueken
Escondido, Calif.

Sailpanzer?

A few days ago I received my first issue of JAM. My father and I have been buying issues of *American Aircraft Modeler, R/C Modeler, Flying Models* and *Model Airplane News* for two years, so I can pretty well judge a magazine's contents. I thought the contents of JAM were great! There was a variety of articles for different tastes (planes, boats, sailcars, etc.) and the models ranged from easy-to hard-to-build. I look forward to future issues of JAM.

I especially liked the "Windjammer" article and it inspired me to look for its RC possibilities. I came up with my own design—Sailcar I. It's 13 inches long, with a 21-in. mast and a 10½ x ½ x 1" balsa block glued to the bottom. The model is made of corrugated cardboard and finished with a coat of Aero-Gloss red dope. As for performance, it would go in 10-foot circles on a paved driveway (although it required a push to get it going around again).

I changed the design some and the result was "Sailpanzer Mk.I." It is 19½ inches long, with a frame of corrugated cardboard reinforced and a wooden 12-in. ruler attached to the bottom. I found that transportation was a problem with my original "Sailcar," so I came upon a collapsible mast for my Sailpanzer—an old broken radio antenna. On top of the deck there is a box for radio installation. You may wonder why I call it a Sailpanzer. I got the idea from the article in JAM on the "Battle of the Bulge"—using Aero-Gloss dope, I applied a hunting tank camouflage and homemade iron crosses.

One suggestion for JAM: Why not publish some simple scale articles for free flight or convertible to single-channel RC? The "Monitor-Merrimac" article looked pretty advanced to me. Keep up the great work!

Nick DeCarlis
New Hartford, N.Y.

Pen Pal Wanted

I don't know much about the different kinds of models. I'd like to make friends with modelers from overseas. I'm hoping to become a Pen Pal to those modelers who know a great deal about any of these areas: Radio-control models and equipment, jet (turbine) engines, helicopters (both real and model), designing models and real machines (transportation) or aeronautics.

Does anyone know where I can get access to an international currency chart (if one exists)?

I am in my teens and I am not very good at writing letters, so please excuse my form. I have been building models for about seven or eight years, but most of the models I have constructed have been plastic. I also have quite a few other things I enjoy doing.

S. Fountain, 360 Davis St.,
Port Colborne, Ontario, Canada

As to the values of foreign currency, we suggest trying your bank for information, or for leads. We'd also suggest that modelers in the United States drop you a note—we've included your full address.

—Editor

FLYING MODELS FOR THE BEGINNER

AMA RACER

by FRANK EHLING

KIT FF-4

TISSUE COVERED
RUBBER-POWERED
PROP ASSEMBLY INCLUDED
FEATURES ADJUSTABLE WING

49¢

Designed by AMA Technical Director Frank Ehling as the beginner's first model. It is very easy to build, yet turns in amazing flights. Kit contains printed covering material on which the model is constructed. Kit includes all material to construct the model except glue.

AMA CUB

by FRANK EHLING

49¢

KIT FF-5

PROP ASSEMBLY INCLUDED
RUBBER-POWERED
TISSUE COVERED.

OVER 500,000 BUILT AND FLOWN !!!

The AMA CUB is another model designed by Frank Ehling for the beginner. It is a simpler version of the AMA RACER, featuring a one piece fuselage, the same type of printed covering plastic propeller assembly and complete instructions.

SIG

SIG CUB

COMPLETE KIT

KIT FF-1

LENGTH: 23"
WINGSPAN: 24"

$1.29

FLIES 1000'
RUBBER-POWERED ENDURANCE MODEL
MOLDED PLASTIC PROPELLER

FULL SIZE PLANS
SPECIAL INSTRUCTIONS
DIE-CUT BALSA
PLASTIC PROP
COVERING TISSUE
RUBBER MOTOR
COLORED STAR DECALS

The SIG CUB fills a definite need for an advanced trainer and sport model that is capable of long high flights. Yet it can be flown from limited areas like school yards. Unique PROGRAMED INSTRUCTIONS aid the teacher and the tenderfoot modeler.

WINGSPAN 12"
PRESHAPED AIRFOIL
FULLY DETAILED PLAN

PIGEON

KIT FF-13

#1 TRAINER

68¢

FLIP

#2 TRAINER
WINGSPAN 14"

KIT FF 14

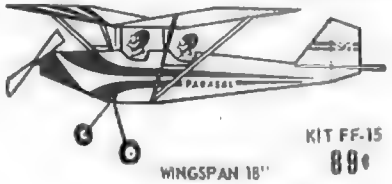
PRESHAPED AIRFOIL
FULLY DETAILED PLANS

78¢

Hand Launched Gliders are a tremendous amount of fun! When properly built and trimmed they are capable of graceful, sustained flight that will thrill every model enthusiast. Both the FLIP and the PIGEON are easy to build if the step-by-step plans are followed carefully. Designed for quick roll-out at the top of the launch, even the novice can achieve long, graceful flights. Rugged design to withstand constant flying.

SIG PARASOL

PROFILE RUBBER-POWERED



KIT FF-15

WINGSPAN 18"

89¢

PLAN IS COVERING MATERIAL
NO PAINTING REQUIRED

SIG TIGER

NEW VERSION OF AN AGELESS OLD-TIMER

WEIGHT: 1 Oz.
WINGSPAN: 21½"

DESIGNED BY PAUL McILRATH

KIT FEATURES:
- Complete Building and Flying Instructions
- Detailed Plans with Isometric Construction Views
- Formed Plastic Propeller
- SIG Contest Rubber Strip for Maximum Turns and High Flight Performance
- Die Cut SIG Balsa Parts
- Covering Material
- Wheels Included

KIT FF-3

$1.95

The SIG Classic Series TIGER is a miniature modern edition of that typical rubber-powered model of the 1930's, popularly called the "Outdoor Commercial". These simple designs, featuring a box fuselage with a cabin, introduced thousands of novices to the thrill of building a model that really flew. In designing the Tiger, Paul McIlrath has retained the fine flight performance and added a pleasing scale-like appearance. The comprehensive book of instructions and building ease make this kit ideal for beginners or a modeling class project

THERMAL DART

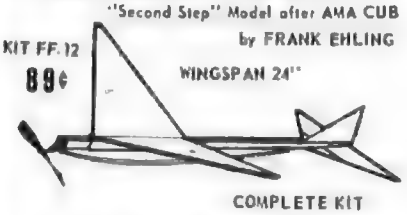
"Second Step" Model after AMA CUB

by FRANK EHLING

KIT FF-12

89¢

WINGSPAN 24"



COMPLETE KIT

BIG 24" WINGSPAN
ULTRA SIMPLE CONSTRUCTION
ATTRACTIVE 3-COLOR BOX
FULL SIZE PLANS
EXCELLENT PERFORMANCE
COMPLETE PROPELLER & NOSE-PIECE ASSEMBLY

Frank Ehling has contributed a second design for a "step-up" model. As easy to build as the AMA CUB, but a big 24" wingspan model that will fly outdoors. It is really an amazing flyer as it outperforms more sophisticated models. It climbs sharply during the motor run and has a smooth transition to a long, flat glide. As with the CUB, the plans are printed directly on the covering material. Construction is just as easy and any beginner can build it.

New 1/2A Profile

DEWEYBIRD MARK I

SCALE APPEARANCE

KIT CL 15

$3.49

049 ENGINE

WINGSPAN: 22½"

Designed by Dave Shipton, owner of Hobby Hide-A-Way Delavan, Illinois The Deweybird Mark I is a semi-scale control line model of Jim Dewey's midget. Dave has created a model that is very easy to build and fly. The beginner should have no trouble with this airplane, yet flight characteristics are such that the advanced modeler will enjoy it. It will perform well on any good .049 engine. There will be larger Deweybirds out soon

Send $1.00 Today for

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The Modeler's Wishbook'

NO POSTAGE REQUIRED WHEN ORDERING CATALOG ALONE

OUR GIANT 1973 SPRING AND SUMMER CATALOG is now ready. Completely revised, it illustrates thousands of model airplanes, hardware, paints and many other items used in the building and flying of model airplanes. Over 244 pages features the famous Sig Line, plus practically all other lines available. Included are radio-control models, gliders, sailplanes, rubber-powered sport, scale, control line stunt, beginners' projects, plus every other conceivable type of model. For sale at your local hobby shop, or send $1.00 today for your copy. You'll agree it's a dollar well spent!

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If he will not supply you, then order directly from our plant. We will ship promptly. To Order, please add $1.00 for postage and handling in the U. S. Canadian orders please add $1.50. Minimum order is $1.00. Please remit by bank draft, check or money order. Print your name and address plainly. Sorry, No C.O.D. shipments. All prices subject to change without notice.

SIG MANUFACTURING CO., INC.

401 S. FRONT STREET
MONTEZUMA, IOWA 50171

NUPITER

(Continued from page 24)

and the model will spiral into the ground. Too little turn and it will stall or loop.

To adjust the turn, bend the rudder tab slightly (1/16 inch) in the direction you want the model to turn. For example, if the model is turning too sharply to the left, bend the tab to the right. Vary the amount of tab offset for the desired amount of turn.

If the model persists in turning left too much, slightly twist (warp) the left wing tip so the leading edge comes up and the trailing edge goes down (1/16 inch or so). This increases lift on the left wing panel and keeps the turn from getting too steep.

After your Nupiter is on the right track up into the sky and down again, you may want to experiment with slight variations in trim for a more floating glide, faster climb, etc. See other articles in J.A.M. or Model Aircraft Handbooks for these suggestions.

SHOW OFF

(Continued from page 47)

Trace the shape on the plywood and cut out the templates almost to the line, using a jig saw or a sharp knife; don't cut the notches until after the templates have been sanded to their final shape. When cutting out the notches, begin by cutting them a little undersize and file them to exactly 1/8", using a piece of 1/8" square balsa stock for a gauge to check notch sizes. This is very important. When the ribs are finished, you will be sure the notches are not too sloppy. I have a flat file which measures 1/8" thick—it works fine for the job. The bolt holes in the templates are the centers of the leadout holes in the ribs, so make sure these are in the proper location. Drill them to match the bolts you will use to hold the ribs sandwiched between the templates. The bolts must be at least 1" long. Remember, whatever the shape of your templates, your ribs will turn out to be the same.

Throwing a plane together and flying isn't all we try to do. Finding better building techniques is important too. The building is the hobby, not flying. The flying is the reward we get from proper methods. So, as with the templates, try again if they don't turn out. We don't always get things right the first time.

To make the ribs, cut 12 pieces of 1/16" balsa sheet somewhat bigger (all around) than the templates. These are then stacked up (use pins to keep them together) and drilled to match the templates. Once this is done they can be bolted together with one template on each side of the stack. Be careful not to bolt them too tight. Just snug them a little more than you can with your fingers, using a screw driver. This way you won't crunch the wood. You can now start trimming them as close to the template shape as you dare with a knife, then finish up with a sanding block. The balsa ribs will sand a lot easier than the plywood, but care must be taken to sand straight. The templates can be sanded out of shape if you are not careful. Lay a straight edge across the stack to see if the ribs have a hump in the middle. It will be easy to see if the stack is sanded straight across at right angles to the templates. Work on this sanding, checking until the stack is flat across at all points, leaving the notching until last.

Once you are satisfied with the outline shape of the ribs, the leading edge and spar notches are easy, much easier than it was putting them into the plywood. Run a saw cut down each side of the notch and file out the middle. I use the same flat file I mentioned before which leaves a perfect 1/8" notch. When the stack is taken apart, you will know they are all the same, and you will have a nice looking wing. Use a hole cutter to enlarge the leadout holes in each rib. If you don't have one, it is easy to make one from a piece of ¼" tubing by sharpening the end with a file. Don't try to drill the holes bigger for you may split a rib. If you must, use a round file to enlarge the holes.

The trailing edge may prove a little difficult, but with care you can turn out a good job. Measure the part on the

(Continued on page 56)

A WINNER! in the JAM MODEL BUILDING CONTEST

BILL SARTORE, Pittsburgh, Pa. - age 14. The Sterling kit of the schooner Blue Nose was covered with several coats of sealer to give it an even and smooth finish. Bill handmade the ratlines, interior of the lifeboats, and bulwark stiffeners. Bill picked the Dremel 572 Moto-shop as his prize.

2nd

JEFF NYSTROM, Cary, Ill. - age 13. The Quarter Pint was built from Paul Denson's plans in the April issue of AAM. This was his first attempt at a scratch built, non-kit, model. He won a twelve issue subscription to JAM.

3rd

DARRELL BELLER, Anchorage, Alaska - age 13. Darrell's Top Flite kit of the P-47 Thunderbolt won third place and a subscription to JAM. The P-47 is powered by a Cox .15 and covered with Super Monokote.

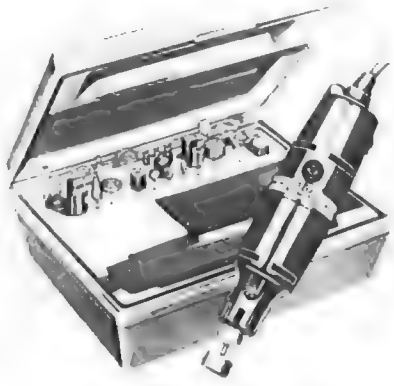
SEND YOUR ENTRY IN TODAY!

A. **Model Origin:**
Any kit that had its origin from a wood, plastic, metal, etc., kit is eligible.

B. **Categories:**
All types of models are eligible, i.e., planes, boats, cars, etc.
1. Boats 2. Cars 3. Tanks 4. Planes

C. **Entrants to submit:**
1. Black and white glossy photos no smaller than 4 x 5 showing various views (minimum of 4). Polaroid pictures are acceptable.
2. Color photo or slide (OPTIONAL)
3. Close-up photos of detailed work may be supplied if desired.
4. A short write-up on the origin of the kit and any special techniques used in the building of your entry.
5. A statement that:
(a) The submitter was the sole builder of the model.
(b) The original kit is available at any hobby shop.
(c) The photos taken and supplied were taken by the submitter.

PICK YOUR PRIZE FOR FIRST PLACE!



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PLAN SERVICE PAGE 58

WHAT'S YOUR QUESTION

(Continued from page 8)

Q: Before I ask my question I have a few comments on JAM. I am 36 years old, and have been modeling since the age of 10. I have been in most everything and enjoyed them all. However, I never saw a magazine in any field that has been as helpful to me as JAM has been. No matter how much experience a person has, basics are often never learned properly. So for filling this gap and much, much more I say thank you to the staff of JAM.

Now, my question. I am building peanut scale planes. I have several plans from "Plans & Things" (Bill Hannan's outfit). One plan calls for airfoil shaped wings 1/16" thick. This calls for ribs of the proper shape and measuring 1/16 by 1/16". How do you make these?

Donald J. Punke, Jr.
Hamburg, N.Y.

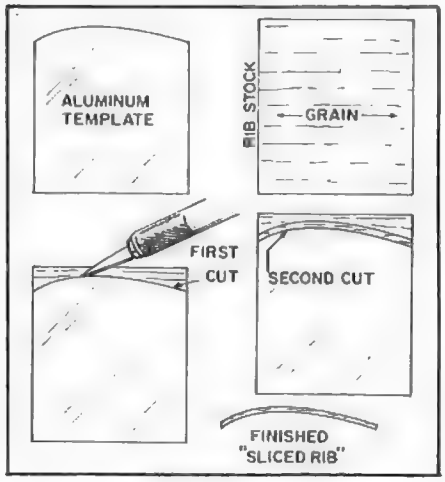
A: Rather than attempting to answer your question myself, it was decided to go right to the expert. Bill Hannan was kind enough to write an answer and draw an illustration much better than I would even hope to do. His letter is quoted below.

"A guy has to be part detective in this business, me thinks! It took several readings of the letter from Donald J. Punke, Jr., before it dawned on me what he was after. Apparently, he is referring to Walt Mooney's design of the Demoiselle, which features the so-called "sliced-ribs." These are quite common to indoor models, but not too well known to outdoor types.

"At any rate, they can be produced fairly simply as follows: First, a template of thin aluminum is cut to the curvature of the airfoil. Our example assumes a constant-chord wing.

"A suitable sheet of balsa stock is cut to the correct chord width. Using the aluminum template as a guide, a cut is made, which forms the top contour of the rib. Next, the template is slid down about 1/16", and a second is made, which forms the bottom of the first rib, and also the top of the next. Owing to the fragile nature of this type of rib, it is a good idea to make a few extra, which takes only a few moments time.

"The illustrations may help to make the sequence of operations clearer."



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(Continued from page 52)

plans and lay it out full-size on 3/16" sheet balsa. Cut the taper from center to the tips. The rib notches also can be marked right off the plans. Be sure not to cut them over 1/16" wide and 1/8" deep. The rib ends must fit snug and not sloppy. At the local hobby shop you may be able to find some trailing edge stock already shaped. If so, cut to length and taper and notch for ribs. The thickness should taper to 1/16" at the trailing edge (see the cross section on the plans.) You must sand the top and bottom the same amount. With practice and patience, you will soon be able to turn out a good-looking piece. But don't be discouraged if yours doesn't turn out like the plans. The plane will still fly.

The assembly method used here will work quite well for a beginner. The planking is 1/32" sheet balsa. Use a soft piece which bends easily. Cut out two pieces 1-3/16 in. wide, and long enough to fit flush with the outside of each end rib. Glue a piece of 1/8" square balsa on top, flush with one edge of each piece. Be sure they are lying flat and straight.

The next step will be building by pinning on top of the plans, but first cover the area on the plans with wax paper for protection from the glue. The first part to pin down is the planking and spar assembly which you have just glued together. Line up the spar in its proper location on the plans. This will have the 1/32" planking under it. Pin through the spar into the plans. This will be the bottom spar and planking. The pins must be put in at an angle so they will not be in the way when the top spar is in place later.

The ribs are now glued into the notches in the trailing edge. Make sure they are in the center. That is if there is any overhang, this should be the same top and bottom. These can be held together during the next step by sticking pins in diagonally (at an angle). Glue this assembly onto the bottom spar and line up the ribs in their proper location. Do not apply any glue to the planking at this time, which should be lying flat. The top spar (with planking attached) can be glued on at this time. The top planking should be sticking out straight just as the bottom planking does at this point. The trailing edge should be blocked up to keep the wing level. The top spar should be directly over the bottom spar. This can be checked with a small square gauge or small triangle. At this point I lay a long flat board over the spar location with weights on it to keep the wing flat and straight.

When this is dry, take the wing off the plans and glue in the leading-edge spar. If the wing is straight, and the ribs made well (as with the templates) this spar should just about fall into place. It should be pinned in place and allowed to dry.

Insert the bellcrank platform, the size of which can be taken off the plans. This is glued down tight to the bottom spar. Try to keep it level front to back. Also do not let it stick out past the front of the ribs, because the planking will not fit down as it should.

The job of finishing up the planking is a lot easier than it looks, although a glue gun will help a lot in this step. Apply glue to the bottom half of the leading edge spar and the bottom half of the ribs; then roll the bottom planking up into place, holding it to the front spar with clothespins. The clothespin clamps I use have been taken apart and turned around. These work well in all kinds of jobs. Be sure to glue well in this step. After this has dried, the same steps are taken with the top half. The planking this time is rolled down and held in place with masking tape. Study the photos through this step and it will be very easy.

Trace the outline of the wingtips on, then cut them from 1/16" balsa. If you add some 1/16" scrap around the outer edges (top and bottom) keeping the grain as shown on the plans, this will help to keep the tips warp-free and at the same time will let you sand a nice round shape that will make your covering job a lot easier. When gluing the place be sure to keep the tip lined up with the center of the rib. To help keep the tips from drooping, a small corner brace is glued in on top and bottom in line with the main spar. If these are cut square, they will line up right.

Bellcrank assembly: The bellcrank with controls attached is bolted in place adding the centersection planking. Notice that the bellcrank is cut down in size. This is easy to do with

wire cutters and a file to round it off. Drill new holes as shown on the plans. A "Z" bend works best in the end of the pushrod which goes into the bellcrank. Once this bend is made, you must make the other bends to shape the pushrod so it will exit through the wing as shown on the plans. The rest of the pushrod is straight, leaving enough to extend past the elevator. The bend at the elevator will be made later.

The leadout wires should be the ½A flexible (stranded) type. They also should be cut a little long. Attach them to the bellcrank along with the pushrod before bolting into the fuse. The method I use to attach the leadouts is to push the end of each through the bellcrank hole and then fold it back about one inch. Wrap this loop tightly with fine wire and solder (resin core). With a little practice you will find this job a snap. If you have it, be sure to rub a small amount of paste flux (resin type) onto the area to be soldered. This will make the solder flow well, making a good bond. Just be careful where you lay down the hot soldering gun. It doesn't belong on the seat behind you!

Drill the hole for the bellcrank bolt into the plywood floor 1/8" in back of the spar and 1/8" outboard of the centerline of the fuselage. When you put this mess of wires into the wing, the leadouts have to be fished through the rib holes. When bolted in place, the bellcrank must work freely. Don't bolt it so tight that it won't swivel. It is best to put some epoxy or white glue around the nut and bolt end to keep the nut from loosening up. I always leave a little of the bolt sticking out past the nut and mash the threads with snips. This will also keep the nut from falling off. When this tedious job is done, the planking can be finished. The bottom of the center section is easy; just cut to size, glue and pin in place. The topside must have a hole for the pushrod exit.

Wing and fuselage assembly: To insert the wing into the fuselage, the cutout in the fuselage may have to be trimmed a little. Mark a centerline on the side of the fuselage. Try to keep the wing centered on this line. The fuselage also should be centered on the wing. This can be checked by keeping an equal spacing of the wing center planking on each side of the fuselage. Be sure to glue well during this assembly.

Tail surfaces: The stabilizer and vertical fin is a simple matter of cutting the wood to size. It is not necessary to sand an airfoil cross section into these parts. Just round off the edges. Glue the cloth hinges well, rubbing the glue in with the fingers. The stabilizer and elevator assembly is glued in its proper place, keeping it level with the wing. The 45-degree stock balsa blocks are important to the structure of the tail end. Glue these well for they will protect the parts from getting knocked loose in rough handling or mishaps. The rudder is glued on next with a slight offset as indicated on the plans. Be sure to keep it square (at right angles) with the stab. When the tail end is dry, the control horn can be bolted in place, and the pushrod bent to fit. Be sure the bellcrank is positioned right before making this bend. I then use a small keeper to secure the pushrod in place.

Covering: The finishing process can be as good or as bad as you want to make it. The framework and rib edges should be given a couple of coats of sanding sealer and then sanded before covering. This makes the covering job a lot easier. The paint job can be started any time you feel like getting started. I'm one of those guys who paints a part as soon as it is made. It helps fill the time while you are waiting for other assemblies to dry. As soon as the wing is together and the rough spots sanded out, give it a coat of sanding sealer. Do the same with the fuselage. The dope dries fast and the parts can be handled in only a few minutes. When all together, the plane should have two or three coats of dope, with a light sanding between coats.

Before covering the wings, glue in two small pieces of aluminum tubing at the tips to run the leadouts through. These should be cut into the top wingtip doubler. Use a small round file, lining up the slot with the holes in the ribs. Glue a washer (which will fit a ¼" bolt) on the outboard wingtip (the outside of the flying circle) for the wingtip weight.

Covering these small wings is easy—just the right size for a beginner. Cut four pieces of light-weight Silkspan big enough to overhang the wing panels. The grain of the paper should run lengthwise with the wing. To check grain, the tissue rips

easy and straight with the grain and rips jagged across the grain. Cover one panel at a time. Lay the tissue (dry) over the wing and spray with a fine mist of water using a Windex sprayer. Pull the edges of the tissue lightly to smooth out the wrinkles. Lift one edge at a time and brush clear dope onto the wood under the edge. Use your finger to wipe the tissue back in place, then brush clear dope over the edge again. The tissue doesn't have to be pulled real tight, just enough so it looks smooth with no sag between the ribs. As it dries, it will shrink tight. Do all four panels this way and allow to dry. Three coats of clear dope will seal the paper making it fuel-proof. Allow to dry between coats. When this is done, the plane is ready for the color coats. A last coat of clear (over the color) will give the plane a good shine. A light sanding between coats will knock off the rough feel.

The last touch is to hold the elevator in neutral and snip both leadout wires to the same length, leaving enough to bend into loops. Wrap the loops with fine wire and solder.

Install a Golden Bee engine with wood screws. Place one small washer between the engine and plywood on both inboard (toward center of flying circle) screws to offset the engine to point outside the circle. Put on a 5¼ x 4 prop and you are ready to go. Flying lines 35 feet long will do fine. The shorter the lines, the dizzier you'll get. If you think this plane is great or have problems, write to JAM and let us know. Happy flying.

Materials Needed

1/32" balsa sheet, 1 pc. 2 x 36" for wing planking
1/16" balsa sheet, 1 pc. 3 x 36" for stab, rudder, wing tips, fuselage, top & bottom
3/16" balsa sheet, 1 pc. 1 x 36" for trailing edge
1/8" square balsa, 2 pc. 36" for spars
3/32" balsa sheet, 1 pc. 2 x 36" for fuselage sides

From scrap box (if you have one): 1/16" balsa, cockpit superstructure; 1/4" balsa, nose blocks; 1/8" blasa, topside stiffener (fuse); 1/8" plywood, bellcrank platform, landing-gear platform, nose; 45-degree stock, stab braces.

Hardware: 1 pc. 1/16" music wire, 1 ½A bellcrank; 1 ½A control horn; 1 ½A leadout wire (flexible); 1 pr. 1¼" racing wheels; 1 pr. ½A wheel retainers.

Editor's Note: *There are two difficult stages in control-line flying. The first is learning to fly with a trainer model, and the other, making the transition to a more advanced model; that is, learning to stunt.*

The stunt trainer really requires that you already know how to fly. Flying inverted is the big test. It is highly desirable to have a more experienced modeler help you.

If you are by yourself with only a helper, remember to take off downwind, and to perform stunts, like loops, on the downwind side of the circle.

First, get to know your airplane in ordinary flight, then start with gentle wingovers. When you can execute full wingovers, become proficient with loops. After that, advice varies. You can try inverted flight off the top of a low loop, or first push on to figure-eights and then the inverted stuff.

Confusion in applying elevator when inverted is the danger point, because up-elevator when upside down will make the plane hit the ground. If possible make your first inverted entries over tall grass, etc. A handy trick is to remember that, if you want the model to go where the wheels are pointed, always use down.

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. . . then go out and get yourself one or more of these nifty little Control Line models. And are they simple! Kits contain from 6 to 9 die-cut Balsa parts as well as the metal engine mounts, complete Control System (less lines and handle), Landing Gear, Wheels, authentic Decals, etc., all ready to use, which makes assembly a cinch IN ONLY MINUTES!

Almost any .049 Engine can be used and the flight performance is just great. . . . and if you bash the ground "when you're not ready to land," they're so light and strong that they're practically damage-free. By the way, Engines from most ready-to-fly plastic models can be used, so if you have one, don't waste it. It might require a little modification to install, tho.

Plans are easy to read and complete. They even have a run-down on beginners' first time flights.

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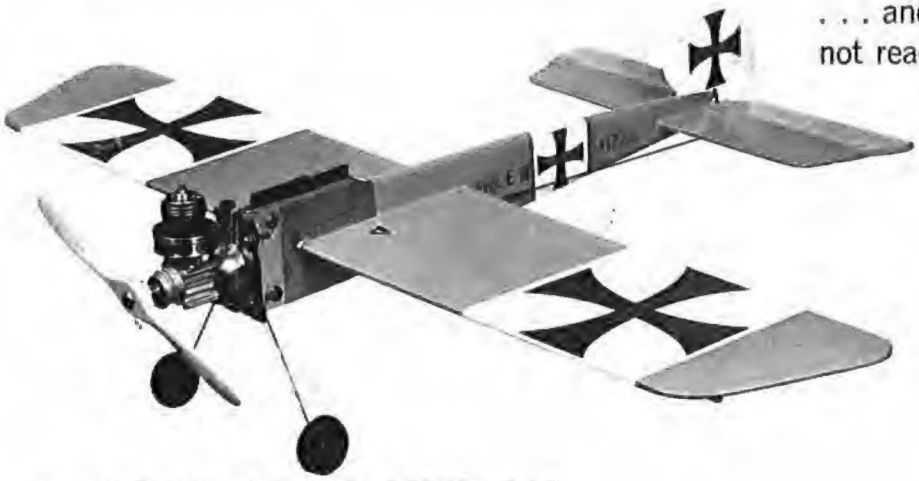

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